FSKTM E-COMMUNITY SYSTEM

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SESSION 2004/2005

ABSTRACT

By the middle of 1990, World Wide Web had transformed the online world tremendously. Users from all over world were able to access and select various types of information from the online world through the system at hypertext called homepage. FSKTM E-Community is a web based system that allows the user to discuss and share any issues or problems in this place. The modules that included in this system are notice board, widen knowledge, complaint, forum and FAQs. Which this module will be able to add, edit, view, delete and reply by the user. The development process of FSKTM E-Community system involves several stages, which include literature review, system analysis and requirement and system design. The reports will also cover the process models, the research plan and methodologies, the analysis an existing system and the design of the new system. The waterfall model with prototyping approach was selected for the development process for the strengths and reduces the risk involved system will use ASP.Net as dynamic web tool, IIS for web server and Microsoft SQL for its database implementation.

ACKNOWLEDGEMENTS

In the process of developing the system, many people have been very kind in lending helping hands, giving invaluable advices and encouragement that contributed to the success in the system.

First I would like to thank my supervisor Mrs. Nurul Fazmidar Mohd Noor and also my moderator Mr. Mohamad Nizam Hj. Ayub for their invaluable assistance, ideas, advice and utmost guidance throughout all the planning stages of this project.

I would also like to thank my friends for sharing ideas, advice and knowledge in the project development.

Last but not least, I would like to share my gratitude to all the people who had kindly leading me a helping hand whenever the occasion call for it and for their useful advice and expertise during project development.

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INTRODUCTION

CHAPTER 1 INTRODUCTION

1.1 Introduction Project

The revolution of internet enabled billion of people all around the world to communicate interactively. Thus, communication not only makes people share their ideas, knowledge, current issue, as well as share the problems in the website. The FSKTM E-Community is one of the e-community solutions for communication over the internet and the target users for committee FSKTM as well.

FSKTM E-Community is a web based systems enable users to contribute their ideas as well as to exchange their knowledge's, doing announcements, complaining and telling their problems to others. This system is based on the WAN, by this way, users can easily surf the mentioned website at anytime.

Faculty Computer Saints and Information Technology have not been practicing FSKTM E-Community system yet. With this practice, it would be good to develop this system for the committee of FSKTM. However this project will be dividing into five modules like:

1 Notice

2 Widen Knowledge

3 Complaint

4 Forum

5 FAQs

The aim of Notice is to announce the important announcements by lecturer,

student or staff. The notice module will divide into three sub module which one announces by lecturer, student and staff.

The aim of widen knowledge module is to share the knowledge like list out the entire URL content virus to prevent ushers from surfing dangerous websites and introducing the new species of certain unknown virus.

Complaining module site has been using to complain and reveal the dissatisfaction of the students toward the unsatisfied condition of the canteen, staffs and facilities in FSKTM. This complaint will be take action by System Management of Complaint.

Forum module site is playing an important role to reveal hot topics or questions and attempt to obtain feedback from the committees of FSKTM. These forum modules will separate to a group which user just can go to the forum part based on category like student just can go to student forum part only.

Problem telling module site is for them to share their problems with others and gain positive advice and encouragement from them. This problems telling is open to all the committees of FSKTM who are volunteer to advice and encourage them.

1.2 Objective FSKTM E-Community

With the aim of FSKTM E-Community, they have the opportunity to explore themselves in the world of caring, which is the main aim of FSKTM E-Community; they can easily make new friends, tell their problems and get advice and encouragement from the listener.

The objective projects are:

i. Develop a community that can communicate with each other between lecturer, student and staff in FSKTM.

ii. Develop a web based systems enable users to contribute their ideas, knowledge, information, doing notices, complaints and telling their problems.

iii. Minimize the gap between lecturers and students, staffs and students.

iv. Exchange and share information and knowledge– a place to share ideas.

1.3 Scope Project

FSKTM E-Community is web based systems that enable users from committee FSKTM to communicate with each other. FSKTM desires to develop a particular system community only for committees FSKTM.

1.3.1 Scope: Network Architecture

What kind of technologies to be used

FSKTM E-Community web based system is used the form of WAN. By this way, the committees can conveniently surf the mentioned website at anytime whether they are being at home or at faculty. So that, this system will become more effective and usability.

1.3.2 Scope: Target User

Who is the target audience and members

FSKTM E-Community is targeted only for committees FSKTM. It only include lecturer, staff, senior and junior. All of them can go to be an ongoing discussion, notice, complaint, forum and FAQs. The user can join the community if have computer and internet to access

and just require a basic knowledge of how to online. Usually they need login as a committee FSKTM. However, FSKTM E-Community web based system to be a private so that the target user is from FSKTM.

1.3.3 Scope: Type of member interactions

What kind of discussions or interactions or event planning does intend to foster

No doubt FSKTM e-community project is going to be an ongoing discussion, notice, complaint, forum and FAQs and they can initiate by the host or by the members. It is also definitely intellectual and can also be of social characteristic, sensitive or even controversial is with the exception of extreme ones. It is an objective for content or knowledge generation focusing around static and dynamic contents in an asynchronous manner.

1.4 Project Development Life Cycle

A development life cycle is to produce a system that able to satisfy the needs of the ultimate users. This development life cycle consists of five phases which are requirement analysis, design, build or coding, evaluation and documentation as depicted in figure 1.1.

The development life cycle of FSKTM E-Community begin at the phase of requirement analysis. The requirements of the entire system are analyzed and specified to fulfill the end users' requirements specifications.

Design is the second phase of development life cycle. This phase is including software design and system design. Design is the first step in the process of transforming

the requirements into close representation of the eventual functional software. It also includes lower level work such as detailed specification of data structures and algorithms with the identified components. Software design is a process of devising and documenting the overall architecture for a software system. It identifying the major components of the system specifying what they are to accomplish, and establishing the interfaces among the components. The system developers design the interfaces of the system and database design to accomplish the system design.

The next phase will be the coding phase where the design specifications will be translated into source modes that the computer can process.

After the coding phase has been completed, a software system is putting through the testing phase before it can be put into operation. Software testing embraces a wide range of activities that not only support the assessment of quality but also help to achieve and preserve software quality.

At the ultimate phase, various forms of documents are created at last. It aims to prepare guidance for users to understand the concept and functionality of each feature in the application. Before moving into the next phase, it is necessary to go through a review process. This will help to detect the errors may occur in each phase.

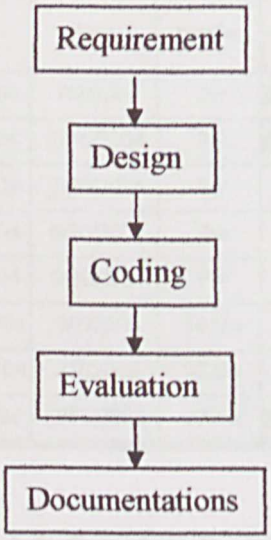


Figure 1.1 Project Development Life Cycles

1.5 Project Schedule

A Gantt chart is an easy way to schedule task. It is essentially a chart on which bars represent each task or activity. The length of each bar represents the relative length of the task. Figure below is an example of Gantt chart where time is indicated on the horizontal dimension and description of activities make up the vertical dimension. This is the project planning for the system.

ID	Task Name	Start	Finish	Duration
1	Feasibility Study	6/28/2004	7/9/2004	2w
2	Literature Review	6/28/2004	7/16/2004	3w
3	Methodology	7/12/2004	7/23/2004	2w
4	System Analysis	7/26/2004	8/20/2004	4w
5	System Design	8/19/2004	9/29/2004	6w
6	System Construction and Implementation	10/28/2004	3/7/2005	18.6w
7	System Testing	10/28/2004	3/7/2005	18.6w
8	Documentation	6/28/2004	3/15/2005	37.4w

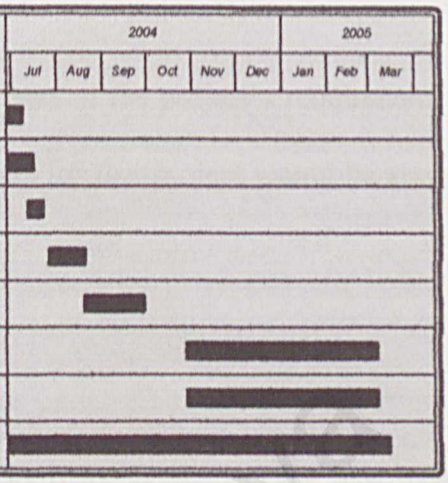


Figure1.2: Schedule Project

1.6 Report Layout

The purpose of this project layout is to give an overall overview and picture of the major contents, which will be included and involved during the development of this project. Below is the report layout:

Chapter 1: Introduction Project

This chapter gives an overview of the project, which includes the objective, project scope, and schedule projects software and hardware requirement.

Chapter 2: Literature Review

This chapter will elaborate the studies in detail which have been done for the project. It also indicates findings, summarization, analysis and synthesis

Chapter 3: Methodology

This chapter emphasizes on the methodology, analysis of the project's requirement and development tools. It explains how the requirements for this project would be acquired and the analysis of the result.

Chapter 4: System Analysis

This chapter analyses the available development tools to choose and the best tools or software to develop and enhance the system.

Chapter 5: System Design

Explaining the conceptual and technical design processes of the system. It includes database and user interface design.

Chapter 6: System Implementation & Development

Showing the documentation of development process which included install both hardware and software. Writing the coding to developed the system.

Chapter 7: System Testing

This chapter gives a description of testing process, which involves both planning and implementation. It also includes the verification and validation of the software to make sure that the error is at the minimum level.

Chapter 8: Conclusion and Future Environment

Conclusion gives a description of an overall system during the development of FSKTM e-community system in the simplest way. However, discussion section elaborates and predicts the unforeseen problems in the future during system implementation as well as seeking appropriate solutions. Future environment will evaluate the system in term of strengths and limitations together will suggestion for further enhancement for the system. The problems encountered during the development of the system will also be illustrated here. Finally, it ends with a conclusion of the whole project.

1.7 Summary

After achieving the objectives of the project and the scope is well being understood, further researches need to be carried out to ensure the system can be run smoothly. Next chapter considers some literatures related to this thesis project.

The purpose of scope project is to ensure our system is developing according to the requirement. Schedule project is to ensure that the project development process model works smoothly.

Research was undergoing to identify the requirement of the user. It wants to make sure that system was developing according to the requirement of the user.

CHAPTER 2
LITERATURE REVIEW

Chapter 2 Introduction Literature Review

Literature Review is research and literature reviews have to be done to dig deeper for information about the proposed system before developing it. Study of the existing system is important at determining scopes and objected of the proposed system. Besides that, extensive research is done in several areas including the Web development and application technologies, appropriate programming languages and DBMS web programming language and technologies, web server and databases, web-based architecture and client server. This will help to acquire the essential knowledge in giving the correct techniques and methods in implementation and design stage.

2.1 What is an E-Community?

E-Community also call electronic community, it is a safe, democratic, and discursive place that exists in cyberspace. E-community is defined as a group of people with common interest and conviction that embraces information and communication technologies in their daily interactions and transactions to improve their quality of lives in significant ways. The community is self sustained and driven by its interest, commitment, requirements and initiatives.

Electronic communities come in many forms, including message boards, threaded discussions, chat rooms, and forums.

All of these communities allow members to exchange ideas, discuss topics, share electronic resources, and get to know each other better.

2.2 World Wide Web

Also called WWW, W3, or simply the web, the World Wide Web is collection of interlinked multimedia documents stored on tens of thousands of independent servers around the world. Web documents can incorporate text, graphics, animation, sound and even video. The web is the fastest growing component of internet. Many companies, government agencies, universities, and individuals have their own web sites. Many times when people are discussing the internet in casual conversation, they are actually talking about the web.

Web sites are divided into pages, which units are containing approximately the amount of information that would fill a single computer screen. A web site's starting point is its home page, which is similar to the cover a magazine. From the home page, the user can access other pages on that site. Each web page has its own specific address, formally known as its uniform resource locator (URL). The URL for web pages follows a particular format. Consider the following example: http://www.google .com.

The http stands for Hypertext Transfer Protocol (HTTP), the communications standard used on the web. The individual computers that make up the web are called web servers or HTTP servers. Because they can interpret HTTP commands, they can use a site's URL to locate it and access its contents. The letters www indicate that this location

is a part of World Wide Web.

2.3 Why FSKTM Need E-Community

The situations of the meantime before have an e-community and the situation after have an e-community of FSKTM.

i. The situation of the meantime

- There is no a space of special communication for exchanging our idea, perception, to share personal problem or discuss certain issue.
- Majoring of the module on the website only particularity provided for lecturers but not for students.
- There is a big gap between the lecturers and students, junior and senior. Student only get to know those lecturers who are teaching them.
- Lecturers, staffs and students do not have the chance to voice out their opinions, knowledge and feelings.

ii. The situation in the future

- There will be a communication space for them to exchange opinion and experience.
- Via e-communication, the gap between lecturers and student and between senior and junior will be eradicated.
- Lecturers, staffs and students can utilize this web for multiple purposes.
- Use time wisely and positively, not browse those unhealthy website which will not bring them any benefit and none widen their know ledges.

- More convenient for lecturers, staffs and students to do announcement in the notice board.

2.4 Analysis on the existing E-Community system

2.4.1 Analysis on communityzero .com

Address URL: www.communityzero.com

Community zero is an interactive website that allows a group of people to communicate and exchange information over the internet in their own private and secure area. Within each area, called an online community, participants are provided access to a suite of powerful tools that enable a group to effectively get organized, share knowledge and communicate. Community zero is essentially a private interactive website, otherwise referred to as an intranet. Only authorized users are granted access, thus protecting the privacy of the sensitive information, contained with the community the degree of security can be set by the administrator of the community.

Advantages of the system:

i. the user capacity and text storage are unlimited
ii. administrative interface provides a series of tools to manage member accounts, communities, broadcast emails and more
iii. it is free of charge
iv. private and secure online communities
v. powerful tools for collaboration and interaction
vi. easy to use- no programming knowledge

Disadvantages of the system:

i. cookies are required when you want to be a member of community zero

ii. User interface is not user friendly because the layout is too complex.

2.4.2 Analysis on circles99.com

Address URL: www.circles99.com

Circles99 is a free online community solution that allows you to bring together family, friends, and associates through an interactive website. User can establish their own online community to stay connects to a group of people. In circles99, user will have a pleasure to exchange information and communicate with others that share a common interest. The cool, feature rich website allows user to meet new friends, exchange ideas and keep in touch through a wide range of interactive online activities. Circles99 is a popular friendship website.

Circles99 offers a host of cool new features like mobile downloads, picture messaging, dedications, e-cards, sms board, chat group, forum to lifestyle news and trendsetting activities. Just imagine, user can capture digital shots with their mobilephones and upload the pictures to the circles 99 website -- another first by Cool Invention. User can also send dedication through SMS which will be posted directly onto the website. And what about crush the popular online game where members can play cupid to one another. Other cool features to be included soon are mCircle, mBlog, mFriends, and mBoard.

Advantages of the system:

i. the user capacity and text storage are unlimited

ii. it is free of charge

iii. private and secure online communities

iv. powerful tools for collaboration and interaction

v. easy to use- no programming knowledge

vi. Members are prohibited from posting rude, vulgar, racist and offensive messages which may threaten or harass the peace of the group, or invade other's privacy.

Disadvantages of the system:

i. To be a member of circles99, one must be 18 years old and above. Those below 18 must get their parents consent.

ii. A one time registration fee of RM3.00 will be charged for membership activation through your mobile phone.

iii. Services like downloading of ring tones, picture messages, operator logos, SMS message board, chat and other related activities come with separate charges.

iv. Members must provide true, accurate and complete information about themselves on the online registration form. The information must be updated constantly.

v. If the webmaster finds the information to be untrue or inaccurate, they reserve the right to suspend, or terminate member's account without prior notice.

2.5 Summary

In this chapter, a complete literature review had been carried out. As a result, it may identify the most compatible tools or methods to be used during the development phase. Besides, all the possibility and consideration also must be taken into accounts during the analysis phase for the project development.

CHAPTER 3
METHODOLOGY

Chapter 3 Methodology

3.1 Introduction

A system development methodology is a very formal and precise system development process. It defines a set of activities, methods, best practices, deliverables, and automated tools for system developments and project managers to use to develop and maintain most or all information systems and software. Methodologies ensure that a consistent, reproducible approach is applied to FSKTM e-community system, and reduce the risk associated with shortcuts and mistakes. Finally, methodologies will produce complete and consistent documentation.

3.2 Concept of Methodology

A methodology is defined as a collection of procedures, techniques, tools and documentation aid. The procedures, techniques, tools and documentation aids help the software developer to speed up and simplify the software development process. A methodology consists of phases that in turn consist of sub-phases, where phases guide the developers in the choice of the techniques that are appropriate. A methodology also helps the system developer to plan, manage, control and evaluate information system projects.

Actually, what are the objectives of the methodology? The objectives of methodology are:-

i. record accurately the requirement of the system

ii. ensures progress can be monitored by provide a systematic method of the development

iii. provide an appropriate time limit and an acceptable budget

iv. produce a system with the well documented and easy to maintain

v. provide an indication of needed changes as early as possible in the development process

vi. provide a system that is user-friendly

There are a few examples of the methodologies, such as:-

i. SSAMD (Structures System Analysis and Design Methodology)

ii. OOAD (Object-oriented Analysis and Design)

iii. RAD (Rapid Application Development)

iv. SSM (Soft System Methodology)

v. ETHICS (Effective Technical and Human Implementation of Computer-based Systems)

3.3 Methodology of FSKTM E-Community System

The methodology use in this FSKTM E-Community system is waterfall with prototyping model.

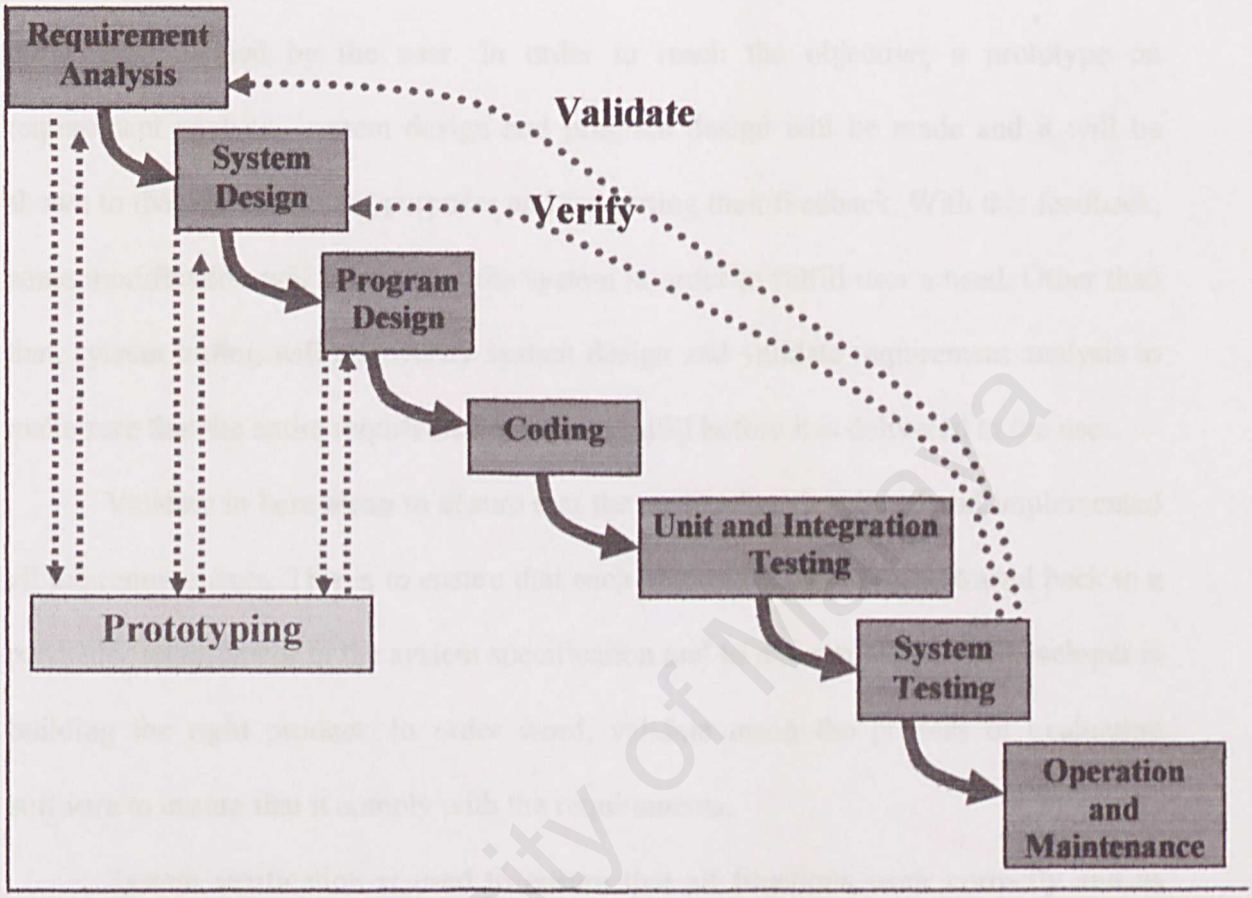


Figure 3.1 Waterfalls with Prototyping Model

Waterfall with prototyping model consists of the combination of two models, which are waterfall model and prototyping model. Waterfall model is a model where one development stage should be completed before the next begin. Prototyping model is a process model that allows all or part of the system to be constructed quickly in order to identify or understand issues that may arise. Prototyping in here means building a small-scale markup system that allows user to try it on.

The objective of using this model is to come out with a complete system with all the criteria needed by the user. In order to reach the objective, a prototype on requirement analysis, system design and program design will be made and it will be shown to the user for testing purposes and for getting their feedback. With this feedback, some modification will be made to the system in order to fulfill user's need. Other than that, system testing will also verify system design and validate requirement analysis to make sure that the entire requirement has been fulfill before it is delivered to the user.

Validate in here mean to ensure that the system has developed and implemented all the requirements. This is to ensure that each system function can be traced back to a particular requirement in the system specification and to make sure that the developer is building the right product. In order word, validate mean the process of evaluating software to ensure that it comply with the requirements.

System verification is used to ensure that all functions work correctly and as needed. In order word, verification checks the quality of the implementation. Each stages of waterfall with prototyping model will be discussed in details below:

i. Requirement Analysis

Data will be gathered from sources like written materials, internet as well as observation and examination of others existing system that are relate to this project. The iterative process of prototyping-revision will be Data Flow Diagram (DFD) is chosen to analyze the collected data because it enables the information domain and functional domain to be modeled at the same time. It is also to be used to graphically show the flow of the data through the system.

The most important outcome from this phase swill be in accurate system requirement specification.

ii. System Design

The iterative process of prototyping-revision will be used to revise the design of the user interface. Interface prototyping will be built using Microsoft Visual Studio. Net. Structured chart will be involved in structuring the system's modules and a Data flow Diagram (DFD) might be used to depict the design of procedural details.

iii. Program Design

The previous phase was approved; the overall system design is used to generate the design of the individual program involved.

iv. Coding

ASP.Net will be used as the server-side programming language and scripting languages such as VBScript, JavaScript and HTML might be used in coding the information and functional domain as well as the control of the proposed system. IIS will be used as web server to connect the user and database. Microsoft SQL Server will be used to develop the database of the system as well.

v. Unit and Integrating Testing

Unit and integration testing is to ensure that the code implemented the design properly. It involves verifying that each unit meets its specification. If the unit testing is fail, the system prototype is redefined again or the system

analysis and design stage is reprocessed again. If unit testing is success, program which had been developed, are integrated and tested as a complete system to ensure that the FSKTM E-Community's software requirement have been meet. The integration and test plan is executed, and the software documentation is updated and completed.

vi. System Testing

First, unit testing will be performed to verify each program module. Next, integration testing is performed associated with the interfacing of those modules. Validation test succeeds when the system functions in the manner that is reasonably expected. The process then will be followed by system testing and acceptance testing.

vii. Operation and Maintenance

A fully update of the hardware and software system repeated for each update. Maintenance is making adaptation of the software for external charges (requirements changes / enhancements) and internal changes (fixing bugs), when changes are made during the maintenance phase, all preceding steps of the model must be revisited. There are three types of maintenance namely corrective (fixing bugs/ errors), adaptive (updates due to environment changes) and perfective (enhancements, requirements changes).

3.4 Comparison Chart of Different Methodologies

Characteristics	Waterfall Model	Prototyping Model	Waterfall with Prototyping Model
Clarity of Requirement	Minimal	High	High
Process Visibility	High	Low	High
Enable Iteration	No	Yes	Yes
Flexibility	Minimal	High	High
User Iteration	Minimal	High	High
Planning	Yes	No	Yes
Success Rate	Varies	Varies	High
System Design & Structure	Good	Poor	Good
Problem Detection	Late	Early	Early

3.5 Summary

A system development methodology is a very formal and precise system development that defines a set of activities, methods, best practices, deliverables, and automated tool for system development. Methodology can helps the system developer to plan, manager, control, and evaluate information system project.

Waterfall with prototyping model is the methodology that uses to develop FSKTM e-community system. It is because:-

i. Helps developers to lie out and see what they need to do, because the model encourages planning before design.

ii. It also helps developers to get the high level view of the system, at the development stage.

iii. Risk and uncertainty of the system can be reduced

iv. System can be change at earlier stage if it does not comply with what expected by the user or customer

v. Prototyping can improve design effectiveness, because the user can try the system and directly integrated into the system in a manner that they clearly understand

vi. It can lead to greater understanding of the project definitions and requirement.

CHAPTER 4
SYSTEM ANALYSIS

Chapter 4 System Analysis

4.1 Introduction of System Analysis

System Analysis is an essential and important phase in software life cycle that describes the detail what will the system do to achieve the objective effectively and efficiently. This phase usually requires a few days time to complete for small-scale project.

The activities in this phase are:

1. Gather the important data about the system.
2. Identify the system requirements.
3. Arrange the requirements with priority.
4. Generate the alternative.
5. Make a presentation to the management.

The purposes for analysis phase are:

- Gain an overall understanding of system data flow and systems work.
- Identifying the major components to be included.
- Research on how this system can be developed using current or maybe latest new emerging technologies.
- To identify the software and hardware requirement to develop and reside the system.
- To analyze and plan control features to develop a robust and reliable system.
- Create a system specification definition that describes both the functional and non-functional requirement.

4.2 Finding

4.2.1 Research and Internet Surfing

The research and development of this system will be in progress throughout two semesters. The methods used to gather materials and resources are as following:-

1. Research on the previous thesis and reference book.

Research has been done on the previous similar thesis to get some general idea on how a healthcare information system is carried out and analyze the benefits and limitations of the project.

2. Surfing information through the Internet.

There are many information are available on the Internet, including some existing systems. It has always been a wise way to create a good solution by looking ones. Learning from and then enhancing existing approach more quality solution.

4.2.2 Brainstorming

Normally, the user will judge the system on its contents, interface, responsiveness and performance. Hence, brainstorming is important to define the contents of the system. I have weekly to do the research to get the idea and guideline from the website and senior to discuss the problem and database design.

4.3 Requirements Analysis

4.3.1 Functional Requirements

Functional requirement are those requirements that the user needs in order to do business. Functional requirements capture the tasks that the business must perform and

as such it does not include implementation details such as what hardware or software the system must use. During this stage, modules must be incorporated into the software is specifying the detail manner. The system provides several general functions, listed below:

1. Notice Board Module

The function of this notice is to enable the lecturer, student or staff announces the notice to the system.

2. Widen knowledge Module

At this module is to share an information and knowledge.

3. Complaint Module

This module is to complaint and reveals the dissatisfaction of the students toward the unsatisfied condition of the canteen, staffs and facilities in FSKTM.

4. Forum Module

This module is enabling the user to create a topic and from each topic it allows to create a post.

5. FAQs Module

This module is placing the problems and question. Their will gain the positive advice, encouragement and the answer.

4.3.2 Functional Requirements for User

Login

This function just can use by FSKTM committees. It has three columns to let users to fill in, which are username, password and category.

User profiles

Users can view and edit their own profile. Besides that, they allow to change their password.

Add

Users can add their notice; widen knowledge, complaint, post and problem.

Edit

Users allow making change the existing notice, widen knowledge, complaint, post and problem that are added by them.

View

Users can view directly what they submit in the view part.

Delete

Users also allow delete the notice, widening knowledge, complaint, post and problem that add by them if they change their mind.

Reply

Users allow replying other user question, opinion, advice on the Forum and FQAs part.

Logout

Users exit the system.

4.3.3 Non-Functional Requirements

Non-functional requirements are requirements which are not directly concerned with the specific functions delivered by the systems. They may relate to emergent systems properties such as reliability, response time and security. It also defines the

constrains on the systems such as capabilities of I/O devices and the data representations used in system interfaces.

Many non-functional requirements related to the system as a whole rather than to individual system features. This means that they are often more critical than individual functional requirements. While failure to meet an individual functional requirement may degrade the system, failure to meet a non-functional requirement may make the whole system unstable. Below is a description of the non-functional requirement identified for the system:

i. User Friendliness

The systems should be able to build a flow of navigation that helps users in navigating to related Uniform Resource Locator (URL) with little efforts through hyperlinks and procedure steps. User interfaces should be user friendly to enhance the interaction between the users and he system. It should employ an easy to user intuitive that will shorten the learning curve for users.

ii. Flexibility

The system should have the capability to take advantage of new technology and resources. The systems should be able to be implemented in changing environments.

iii. Response Time

System response time is an important issue especially when the system involves the web. In order to have fast response times, the processing in the server is reduced by having

some of the input validation done on the client side by using client side scripting language.

iv. Reliability

Reliability refers to the expectation of a system to perform its intended function accurately. A reliable system should be consistent while functioning. Thus, the system should be reliable in performing its functions and operations without delay in response time during the concurrent usage.

v. Usability

The security features prevent unauthorized access, alteration or destruction into the systems. Each access by user should be authenticated by the systems. Valid user ID and password are needed to ensure confidentially and security of users data.

vi. Modularity

Modularity is a key factor in order to provide a good program. The system is broken into sections or modules so that functions of objects could be distinct from one another this characteristic eases the testing and maintenance phase. In systems design, modularity of program sections is applied from the very beginning because this will lead to easy modification and enhancement in the future.

4.4 Operating System

4.4.1 Windows 2000

Microsoft Windows 2000 built on Windows NT technology and an easy-to-use, familiar windows 98 user interface. Window 2000 makes business users more

productive.

Its integrated web application and broad support for mobile computers and hardware devices makes it the easy way for business users to connect to the internet anywhere and anytime. And it rock-solid reliability and improved manageability simplify desktop management for IT Professionals.

The combined features of windows 2000 create the mainstream operating system for desktop and notebook computing in all organizations. It has the best business features of Windows 98 Plug and Play, easy-to-use user interface, and power management and made them better, plug integrated the strengths of Windows NT Standards-based Security, manageability and reliability. Whether deploy Windows 2000 on a single computer or via a worldwide network, Windows 2000 increases the computing power while lowering the total cost of desktop ownership.

Kind	**Server/ mainframe**	**Desktop/ workstation**	**Handheld**	**Realtime**
Proprietary custom	Low quality servers	Low quality workstations	Not appropriate	Not appropriate
Current Version	**Hardware supported**	**Number of bits**		
		Maximum Processors		
2000	Pentium	32bits (Professional and		

		server) partially 64bits (advanced server) bits, 2 (professional), 4 (server), 8(server advanced) processors.	

4.4.2 Windows XP

Windows XP Professional integrates the strengths of Windows 2000 Professional, such as standards-based security, manageability and reliability, with the best business features of Windows 98 and Windows Millennium Edition, such as Plug and Play, simplified user interface, and innovative Support Services. Windows XP Professional is built on the proven code base of Windows NT and Windows 2000, which features a 32-bit computing architecture and a fully protected memory model. This combination creates the best desktop operating system for business.

Whether your business deploys Windows XP Professional on a single computer or throughout a worldwide network, this new operating system increases the computing power while lowering cost of ownership for desktop computers.

Kind	**Server/ mainframe**	**Desktop/ workstation**	**Handheld**	**Realtime**

Proprietary custom	Microsoft intends Windows XP for server use (but it is the least secure, most hacked, and least powerful of all server operating systems)	Microsoft intends Windows XP for workstation and desktop use	Not appropriate	Not appropriate
Current Version	**Hardware supported**	**Number of bits** **Maximum Processors**		
XP	Intel/Cyrix/AMD Pentium	32bits,2(professional), 4(server),8(server advanced) processors.		

4.4.3 Linux

LINUX is a free UNIX-like operating system that runs on Intel/Cyrix/AMD Pentium, Intel 80x86, Motorola/IBM PowerPC, Motorola 680x0, Sun SPARC, SGI MIPS, DEC Alpha, HP PA-RISC, DEC VAX, ARM, API 1000+, and CL-PS7110.

Linux is a free (GPL Licensed), from scratch operating system based heavily on the POSIX and UNIX APIs. It supports both 32 and 64 bit hardware and provides a

stable multi-user internet ready operating system.

Linux can be downloaded for free over the Internet or obtained inexpensively with support and documentation from a number of commercial vendors. Linux uses internet and industry standard components and protocols giving a system with complete network integration. The operating system can act as a server for most major file serving protocols, and provide all the major internet applications.

Kind Open Source	**Server/ mainframe**	**Desktop/ workstation**	**Handheld**	**Realtime**
UNIX	small and medium scale server systems	for those familiar with UNIX	experimental and hobbyist only	Not appropriate
Current Version	**Hardware supported**	**Number of bits** **Maximum Processors**		
2.6.4	Intel/Cyrix/AMD Pentium, 80486, 80386,80286(partial port),8086(partial port), IBM/Motorola PowerPC, IBM	32 or 64 (depending on the processor used).		

	RS/6000, Motorola 68060,68040,68030 , 68020, 68000, Sun SPARC,Sun SPARC64 (Ultra), SGI MIPS, DEC Alpha,HP-PAISC, ARM, API 1000+, CL-PS7110		

4.5 Web Databases

A web database is a data store or information repository that allows access through a query language or application programming interface (API). This access is not typically or commonly line or written through the interface that are specially designed to be use on a specific computer platform. This is the difference between a conventional database system and a web database.

Web database allow access via other web applications, which specifically forms that are developed using standardized (HTML) tags, ActiveX controls and client side scripts using VBScript or Jscript. Using facilities available in HTML, application programs on the web server are accessed through server side program via Common Gateway Interface (CGI), server specific interfaces such as Microsoft's ISAPI or server side scripts environment such as IIS's ASP that uses VBScript or Jscript.

HTML forms interfaces enable programmer to create application that integrate database functionality and provide access to organization data repositories on behalf of client. Application is design solely for the purposes of querying a database and returning specific information. This capability to integrate a database into application that can be accessed by user utilizing a web browser is what makes a database a web database.

Database technology is used in a variety of application. Some serve only a single user on a single personal computer while others one for multi user. In order to choose a reliable database, the database must be able to ensure the safety and security of a data. The database is at the care of all mission critical business application and by choosing the wrong database can trigger drastic downstream results.

Most organizations maintain a variety of autonomous computer database that supports basic infrastructure needs and classic information system. In most web-based application, these database server as the basic building blocks for information services. Organization might want to use this database in their application for several reasons:

1 To better manager the serving of large, document based information repositories to internal and external users of the information.

2 To unlock the potential of unused information in organization databases. Information from databases in various parts of organization such as finance, human resource, project management and others can be consolidated using web-based application and served to users as through it were from a single source. Databases do not have to be physically located with the users of the database application.

3 To extend the functionally of web server, so that information maintained, will be

available to the general public and government agencies whose primary product is information.

4.5.1 Microsoft SQL Server 2000

Microsoft SQL is a significant tool in many regards, from data warehousing to application that require not only a large amount of information but also may different simultaneous users. It is also a key component in answering data management requirements and powerful as well as comprehensive database.

Microsoft SQL is the compact database for rapidly developing applications that extend enterprise data management capabilities to devices. The users can manipulate the data directly from the client side. Most of the time the data is validated first before it is updated into the database in server side.

It is tightly integrated with Microsoft Back office family products as well to enable organization to improve decision making and streamline the business process and it is admittedly the best database for Windows NT server 4.0.

Beside that, SQL Server maintains referential integrity and security and ensures that operation can be recovered in the event of numerous types of failure. It can control the access for the type of information that can be retrieved by the user.

It also supports internet database integration. It allows the user to automate the publishing of database information in HTML documents and allows all the build active websites as well as letting us to conduct processes on the Internet.

When combining the IIS with the SQL Server Internet connector, it gives users the complete internet database publishing capabilities. It also provides the function for

transparent distributed transactions. This means that it provides automatic distributed update capability across two or more SQL Server transparent to desktop application, making it simple to use and guarantees the integrity of transaction of spanning multiple servers.

4.5.2 Microsoft Access

Microsoft Access is a windows-based database management system that can runs under windows 95/98/2000/XP/NT operating system. It can be viewed as a large repository in which table s reports, queries and other objects are stored. The Microsoft Access package is one of the best selling relational database packages for windows on the market. It is estimated the currently more than 10 millions people using this database package.

Access provides an inexpensive yet powerful database solution for small-scale projects and yet easy to use. With access, we can design and use database whether simple or complex very quickly to create tables, Forms, queries and reports. To make the task even simpler, Access comes with a set of wizards. All we need to do is answer a few questions and Access will do the rest for us.

Besides that, Access also allows users to indicate how tables should be related to each other. A table can has referential integrity that allows only one parent record for each child record. Access allows users to make changes to the structure of a database table. User can add, delete and rearrange fields in the table structure.

Access also provides a set of tools to customize application such as Microsoft Word and Microsoft Excel. In short, Access is designed to meet even the most exacting

personal or organization's database needs.

4.5.3 MySQL

MySQL (pronounced "My ess cue el," not "mysequel") is an open source Relational Database Management System (RDBMS) that uses Structured Query Language (SQL), the most popular language for adding, accessing, and processing data in a database. Because it is open source, anyone can download mySQL and tailor it to their needs in accordance with the general public license. MySQL is noted mainly for its speed, reliability, and flexibility. Most agree, however, that is works best when managing content and not executing transactions.

The MySQL relational database system was first released in January, 1998. it is fully multi-threaded using kernel threads, provides application program interfaces (APIs) for C, C++, Eiffel, Java, Perl, PHP, Python, and Tcl, allows for many column types, and offers full operator and function support in the SELECT and WHERE parts of queries. The development team working on future releases of MySQL plan to unveil MySQL 4.0 in mid-2001. its features will include a new table definition file format, enhanced replication, and more functions for a full-text search. Later, MySQL developers hope to add fail-safe replication, a port of MySQL to BeOS, and an option to periodically flush key pages for tables with delayed keys. Over time, MySQL plans to be fully ANSI 92/ ANSI 99- compliant.

MySQL currently runs on the Linux, UNIX, and Windows platforms. Many Internet startups have been especially interested in MySQL as an alterative to the proprietary database system from Oracle, IBM, and Informix. Yahoo's news site uses

MySQL.

4.6 Software Architecture

There are a few architectures available now: mainframe architecture, client-server architecture, two-tier architecture and three-tier architecture.

i. Mainframe architecture

In mainframe system architecture, all operation is within the central host computer. User interacts with the host through a terminal that captured keystroke and sends that info to the host. Mainframe architecture is not tied to a hardware platform. User interaction can be cloned using PCs and UNIX Workstations. A limitation of mainframe architecture is that is doest not easily support graphical user interface or accesses to multiple databases from graphically dispersed sites.

ii. Client – Server-Architecture

Client is a networked information requester, usually a PC or Workstation that can query database and or other information from a server. Clients rely on servers for resources, such as files, devices, and even processing power.

Server is a computer, usually a high-powered workstation a minicomputer or a mainframe that houses information for manipulation by networked clients. Server is dedicated to managing disk drives (file servers), database (database servers), printers (print servers), or network traffic (network servers).

Client-server is network architecture in which each computer or process on the network is either a client or a server. Client-server architecture implies a cooperative

processing of requests submitted by a client, or requester, to the server, which processes the requests and returns the results to the client. The client manipulates the data and presents the result to the user.

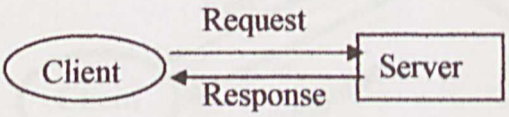


Figure 4.1 One-to-one Client Servers

Client-Server solutions can be in a many-to-one design that is more that one client typically makes requests of the server.

iii. Two-tier Architecture

Two-tier architecture refers to client or server architectures in which the user interface runs on the client and the database is stored on the server. The actual application logic can run on either the client or the server. There are only the architecturally tiered data server and client.

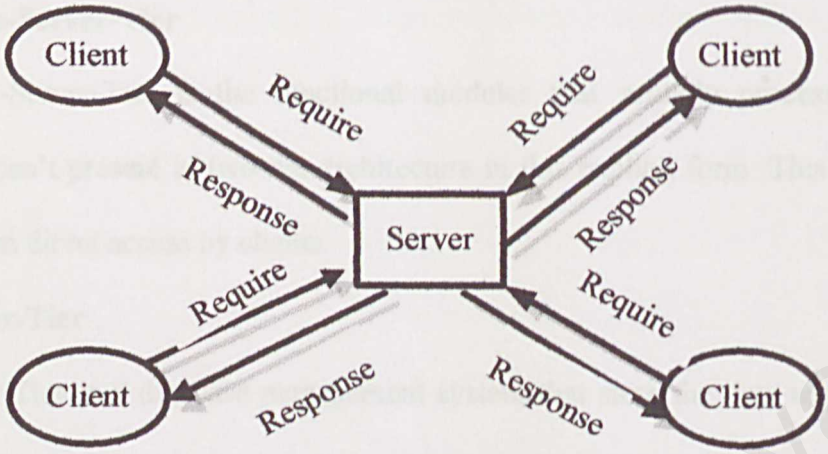


Figure 4.2 many-to-one Client Server

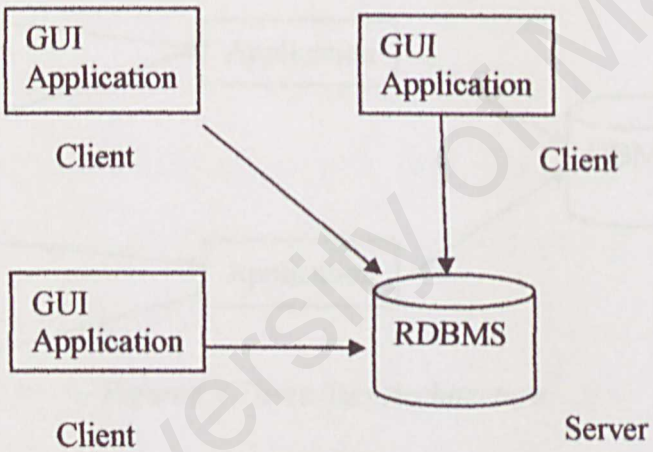


Figure4.3: Two-Tier Architecture

iv. Three-tier Architecture

Three-tier architecture is a special type of client or server architecture consisting of three well-defined and separate processes, each running on a different platform.Three-tier consist of:

Client-Tier

Client-Tier is the user interface, which runs on the user's computer

Application-Server-Tier

Application-Server-Tier is the functional modules that actually process data. This middle tier isn't present in two-tier architecture in this explicit form. This tier protects the data from direct access by clients.

Data-Server-Tier

Data-Server-Tier is a database management system that store the data required by the middle tier.

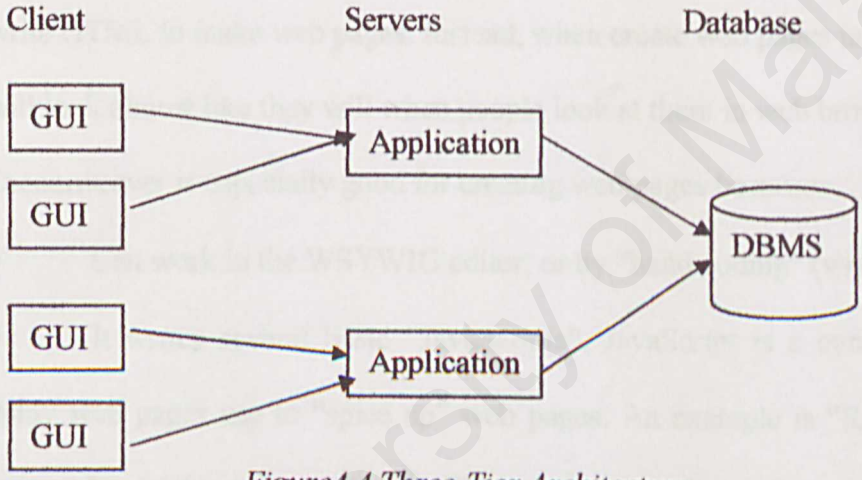


Figure4.4 Three-Tier Architecture

4.7 Web Application Development Tools

4.7.1 Microsoft Visual Studio.Net

Microsoft Visual Studio.Net is the latest development tool for developing web application and Web Services which supports multi-language such as C#.Net, Jscript. Net, C++. Net and VB. Net. With this development tool, powerful applications can be built faster and effectively. Besides that, the main purpose is to build the next-generation Internet or Span any platform or device.

Visual Studio.Net is the only development environment built from the ground up for XML Web Services. By allowing applications to share data over the internet, XML Web Services enable developers to assemble applications from new and existing code, regardless of platform, programming language or object model.

4.7.2 Dreamweaver

Dreamweaver is a professional "WSYWIG" program for creating web pages. WSYWIG Stands for "What you see is what you get." This means that you DO NOT write HTML to make web pages. Instead, when create web pages in DreamWeaver, they will look almost like they will when people look at them in web browsers.

Dreamweaver is especially good for creating web pages because:

- Can work in the WSYWIG editor, or by "hand coding" (writing) the HTML
- It writes several basic "JavaScripts". JavaScript is a computer language that many web pages use to "spice up" web pages. An example is "Rollover Images." An image change if put mouse over it. That is a "rollover image."
- It has many tools to help or a team manages a site.

4.7.3 Adobe Photoshop

Adobe Photoshop is hands down, the most popular program for creating and modifying images for the web. Photoshop is a bitmap-based program. Vector-bases programs include Adobe Illustrator and Macromedia Freehand.

Because Photoshop is a bitmap-based program, this means that all images created in Photoshop are made up of tiny pixels of different colors or black ad white tones on your computer monitor.

There tiny pixels can be manipulated in infinite ways and this helps give Photoshop much of its power and flexibility. We can copy pixels, move pixels, re-colour pixels, etc. the choices are basically limitless.

In the printing world, Photoshop helps us account for variables in the printing process by allowing us to correct tones and colours. A tone is the darkness or lightness of areas within a black and white photograph or halftone.

It is important to note the tones you see on your computer monitor will not match the final output of the press. These pages are designed to help you compensate for these differences.

When save a file in Photoshop, the goal is to have the image ready to imported into a desktop publishing program, as is with NO modifications to be made in the desktop publishing software.

4.8 Web Application Programming Language

4.8.1 ASP.Net

ASP.Net is a programming framework built on the common language runtime that can be used on a server to build powerful web applications and Web Servers. ASP.Net offers several important advantages over previous Web development models:

a. Enhanced Performance

ASP.Net is compiled common language runtime code running on the server. Unlike its interpreted predecessors, ASP.Net can take advantage of early binding, just-in-time compilation, native optimization, and caching services right out of the box. This

amounts to dramatically better performance before you ever write a line of code.

b. Flexibility

Because ASP.NET is based on the common language runtime, the power and flexibility of that entire platform is available to web application developers. ASP.NET is also language-independent; any languages can be used in developing applications. Further, common language runtime interoperability guarantees that existing investment in com-based development is preserved when migrating to ASP.NET.

c. Simplicity

It makes it easy to perform common tasks, from simple form submission and client authentication to deployment and site configuration. Additionally, the common language runtime simplifies development, with managed code services such as automatic reference counting and garbage collection.

d. Manageability

ASP.NET employs a text-based, hierarchical configuration system, which simplifies applying settings to your server environment and web applications without any help from administrator. An ASP.NET Framework application is deployed to a server simply by copying the necessary files to the server.

e. Scalability & Availability

ASP.NET is designed to improve performance in clustered and multiprocessor environments. Processes are closely monitored and managed by the ASP.NET runtime. So that if one misbehaves (leaks, deadlocks), a new process can be created, which maintains application constantly available to handle requests.

f. Customizability and Extensibility

It is possible to extend or replace any subcomponent of the ASP.Net runtime with flexible custom written component. Implementing custom authentication or state services have never been easier.

4.8.2 JavaScript

JavaScript is an interpreted programming or script language from Netscape. It is somewhat similar in capability to Microsoft's Visual Basic, Sun's Tcl, the UNIX-derived Perl, and IBM's REX. In general, script languages are easier and faster to code in than the more structured and compiled languages such as C and C++. Script languages generally take longer to process than compiled languages, but are very useful for shorter programs.

JavaScript is used in website development to do such things as:

- automatically change a formatted date on a web page
- cause a linked- to page to appear in a popup window
- Cause text or a graphic image to change during a mouse rollover.

JavaScript uses some of the same ideas found in Java, the compiled object-oriented programming derived from C++, JavaScript code can be imbedded in HTML pages and interpreted by the web browser (1 client). JavaScript can also be run at the server as in Microsoft's Active Server Pages before the page is sent to the requestor. Both Microsoft and Netscape browsers support JavaScript, but sometimes in slightly different way.

4.8.3 Visual Basic.Net

Microsoft Visual Basic.net is the newest, most productive version of the Visual Basic tool set that enables developers to address today's pressing application development issue efficiently. Visual Basic.net enables you to create rich applications for Microsoft Windows in less time; incorporate data access from a wider range of database scenarios, create components with minimal code and build web-based application efficiently.

Build more robust window-based applications with less code and maintain existing code without the need to rewrite moreover; it can create reusable, enterprise-class code using full object-oriented constructs and reuse all of your existing ActiveX Controls with Visual Basic.net, not only it can build applications more rapidly, but also can deploy and maintain they with greater efficiency. Furthermore, it is flexible and simplified data access with Microsoft ADO.net and Microsoft ActiveX Data Objects (ADO) data access. Finally, it can develop applications using the most readable and easy-to-write programming language available faster and more effectively.

4.9 Web Server

4.9.1 Internet Information Services (IIS)

IIS (Internet Information Services) is a group of Internet servers (Web or HTTP, FTP, and Gopher) and other capabilities for Microsoft's Windows NT and Windows 2000 Server operating systems. IIS is Microsoft's bid to dominate the Internet server market that is also addressed by Netscape, Sun Microsystems, O'Reilly, and others.

With IIS, Microsoft includes a set of programs for building and administering Web sites, a search engine, and supports for writing Web-based applications that access database, Microsoft points out that IIS is tightly integrated with the Windows NT and 2000 Servers in a number of ways, resulting in faster Web page serving.

Microsoft includes special capabilities for server administrators designed to appeal to Internet Service Providers (ISPs). It includes a single window (or "console") from which all services and users can administered. It's designed to be easy to add components as "snap-ins" that you didn't initially install. The administrative windows can be customized for access by individual customers.

IIS includes security features and promises that it is easy to install. It works closely with the Microsoft Transaction Server to access database and provide control at the transaction level. It also works with Microsoft's Netshow in the delivery of streaming audio and video, delayed or live.

4.9.2 PWS

Personal Web Server (PWS) is for Windows based operating systems only. It allow run Active Server Pages (ASP) from our personal machine. We can test them without actually having to upload them to a server that supports them. This is great for just testing purposes OR just to try asp out before invest the money into a web hosting company that supports ASP.

4.10 Development Technology that be Selected

4.10.1 Operating System and Platform

Microsoft Window XP Professional will be used as the development platform for the proposed system. The client and server side of the system can both be installed on windows XP professional.

Window XP Professional was chosen as the operating system of choice due to several factors:-

1. Reliability

Window XP Professional is far more compatible with legacy applications. Microsoft has been working hard on hardware and software compatibility issues.

2. High Security

The NTES file system that is built on security model in Windows NT 4.0 and windows 2000 provides secure access to file system objects and is programmable. Hence, the system's document management is protected.

4.10.2 Software Development Tools

The Microsoft Visual Studio.NET 2003 provides the programming model for building, deploying, and XML Web Services. The Microsoft Visual Studio.NET 2003 delivers business value with faster time to market, improved system flexibility, and reduced costs.

Advantages of Visual Studio.NET:

i. Rapid Development for the Server and Data Tiers

The component designer and server Explorer work in concert to enable visual composition of middle-tier business logic components. Built-in ADO.net and Visual Database Tools provide support for creation of professional data-driven software.

ii. **Reliability and Security**

Built on the proven foundation or the .NET Framework, Visual Studio.NET 2003 employs a fine-grained security policy for user-based, role-based, and code access security models.

iii. **Unmatched Support for XML Web Services**

Improved Add Web Reference dialog box, the web Services Development Kit (WSDK), and support for SOAP1.1 combine with the Web Service Project template, built-in UDDI support, and intuitive designers to proved unparalleled capabilities for building and consuming XML Web Services.

iv. **Mobile Web Application Development**

Wireless device support enables you to easily extend your new or existing web application to over 200 mobile devices. ASP.NET mobile controls intelligently render on a brad range of devices. Freeing developer from worrying about the unique capabilities of each device.

v. **Smart Device Development**

Native support for the .NET Compact Framework enables development, debugging, and automatic deployment of applications to smart devices including Microsoft Windows CE.NET and Pocket PC-powered devices of

robust emulator ensures accurate and rapid development of smart device applications without the need for a device.

vi. **Professional software for Windows, the web and Devices**

Visual Forms Designers expedite the creation of rich desktop applications for windows, dynamic, broad-reach web applications and applications for a wide range of devices.

vii. **Simplified Application Deployment and Maintenance**

No Touch Deployment enables Windows-based applications to be distributed with the ease of Web applications, while side-by-side application deployment helps alleviate DLL versioning issues. Built –in support for Windows Installer technology provides advanced options for creating windows and web deployment packages.

4.10.3 Web Servers

I have decided to use Microsoft Internet Information Server (IIS) as the System Web-Server because it can be fully supported by window XP professional and provide powerful security, administration and development functionality. It is also one of the best web servers on the market and it is a high-end enterprise-level server. IIS is considered by experts to be just as powerful as and much easier to set up and maintain than many of its UNIX-based competitors.

Advantages of IIS:

i. Offers a superb platform for building sophisticated Internet applications.

ii. Easy to install and uninstall.

iii. Accessible since all kinds of browsers can work with it.

iv. Allows for hosting multiple sites.

v. Provides capabilities for secure transaction with the SSL (Secure Socket Layer) support and for authentication.

vi. Windows- based web authoring & development tools are supported.

vii. Integration with existing industry-standard database and other ODBC-compliant databases.

4.10.4 Database

Microsoft SQL Server 2000 works well with databases of any size. It contains all the user-friendly features, works more efficiently and has the ability of handling hundreds of transactions simultaneously without affecting performance. There fore, SQL Server 2000 has be chosen to act as the database management software for the development of DCSIMS.

Advantages of Microsoft SQL Server 2000:

i. Rich XML Support

Simplify the integration of your back-end system and data transfer across firewall using XML. Most viable solution to accommodate the vast storage requirements.

ii. High Availability

Maximize the availability of your business applications with log shipping, online backups, and failover clusters.

iii. Scalability

Scale your applications up to 32 CPUs and 64 Gigabytes (GB) of RAM. SQL Server 2000 has demonstrated record-breaking performance the au can leverage.

iv. Integration with Windows Server System-BizTalk Server and Commerce Server

SQL Server 2000 in conjunction with other Microsoft windows Server System integrated server software provides even more power for you e-business.

v. Simplified database Administration

Automatic tuning and maintenance features enable administrations to focus on other critical tasks.

4.10.5 Scripting Language

With ASP.NET the pages are compiled common language code executing on the server. This allows for advantages and forces some charges in the traditional ASP programming. Advantages of ASP.NET:

i. Enhanced performance

ASP.NET is compiled common language runtime code running on the server. Unlike its interpreted predecessors, ASP>NET can take advantage of early binding, just-in-time compilation, native optimization, and caching services right out of the box.

ii. World-Class Tool Support

The ASP.NET framework is complemented by a rich toolbox and designer in the Visual Studio integrated development environment.

iii. **Power and Flexibility**

ASP.NET is language-independent, so you can choose the language that best applies to your application or partition your application across many languages.

iv. **Simplicity**

ASP.NET page framework allows you to build user interfaces that cleanly separate application logic from presentation code and to handle events in a simple, VB- like forms processing model.

v. **Manageability**

ASP.Net employs a text-based, hierarchical configuration system which simplifies applying setting to your server environment and web applications.

vi. **Customizability and Extensibility**

ASP.NET delivers a well-factored architecture that allows developers to "plug-in" their code at the appropriate level.

vii. **Security**

With built in with authentication and per-application configuration, you can be assured that your applications are secure.

4.10.6 Web Browser

Web Browser, that have chosen is Internet Explorer. It is because of some unique features that the other browser doesn't have. One of them is it interact well with both the scripting languages like VBScript and JavaScript. Both JavaScript and

VBScript are essentially plug-in scripting languages; they interact with Internet Explorer's underlying ActiveX scripting architecture to drive the Web Browser.

If IE is chosen as the browser, then we cannot assume that all users will use IE as their browser. Users have their authority to use the browser that suit to their application.

There are two ways to solve the problem:

1. Code for one browser only. This is not really a viable solution. By using Navigator only the JavaScript that will limit our web page's audience.

2. Code only to the least common denominator. By limiting the JavaScript to that which works for both Navigator and IE, developers will have access to most of the functionality they need. The code should be tested with all possible environments.

4.11 Hardware & software Requirements

4.11.1 Server Hardware Requirements

The server computer's hardware requirements are:-

1. With Pentium 4 CPU 2.40Ghz
2. 5GB above of free space in hard disk
3. minimum 128 MB RAM
4. Running on TCP/IP network with a web browser installed (recommended at least 28.8 Kbps)

4.11.2 Server Software Requirements

Table 4.1 Server Software Requirements

Software	Description
Microsoft Windows XP Professional	Network Operating System
Internet Information Server 2002	Web-server services
Microsoft SQL Server 2000	Database connectivity interface driver
Microsoft Internet Explorer 6.0 (or above)	Precondition for ASP.NET installation
Microsoft Visual Studio. Net	Programming model
ASP.Net	Programming language

4.11.3 User Hardware Requirements

1. Minimum 64MB RAM
2. Running on a TCP/IP network with a web browser installed. (recommended at least 28.8 Kbps)

4.11.4 User Software Requirements

Microsoft Internet Explorer 6.0 and above

4.12 Summary

System analysis is the most important process of system development. A good methodology a plan can guide the system development towards the project goals. System analysis is used to determine and clearly to find out what a system does and to analyze the system requirements either is functional requirement or non-functional requirement.

Reviewing of the methodology being used, procedure that specifies the system requirements, analysis of development technologies will help in gaining the advantages and knowledge about the implementation of the system.

CHAPTER 5
SYSTEM DESIGN

Chapter 5: System Design

5.1 Introduction

System design is a complementary problem-solving technique to system analysis that reassembles a system's component pieces back into a complete system. With requirements that been identifies in the chapter 4, it use to define the problem and find the solution. Then the system would be designed to transform the informal idea to detailed implementation description. Transformation user requirement into a working model can be used as guidance before developing the complete system. The design of this system would be carrying out in a few aspects, which are:-

1. System Architecture
2. System functionality Design
3. Database Design
4. User Interface Design

5.2 System Architecture

After doing some survey on the client/ server architecture, three-tier client/server architecture has been chosen for FSKTM e-community system.

The frontier or the application tiers of the system consist of all the necessary applications. In this layer, the main application component that appears to the user is the IE 6.0 browser. This layer with provide the user interface. The application is always reside within the web server, which is the IIS 6.0 (Internet Information Server).

The middle tier is known as the functionality or service tier. The communications between ties tiers and the frontier depend on the Hypertext Transfer Protocol (HTTP) for the web pages transfer. The functionality tier consists of the components that are created to support the system such as searching for record and other configuration. These entire components require ASP.NET to perform the functions in the web servers. The IIS is in this tier will process the request from the client and produces the result in web pages format. The IIS will also process any data request of the user by linking to the database server, which contain in the bottom tier. The IIS will do other extra additional activity during the data processing.

The bottom tier is the data repository for the system. The data repository is built by the SQL database. It functions as the main database for the system. The components in the middle tier are connected with the SQL database in the bottom tier through the combination of the Structured Query Language (SQL) and Open Database Connectivity (ODBC).

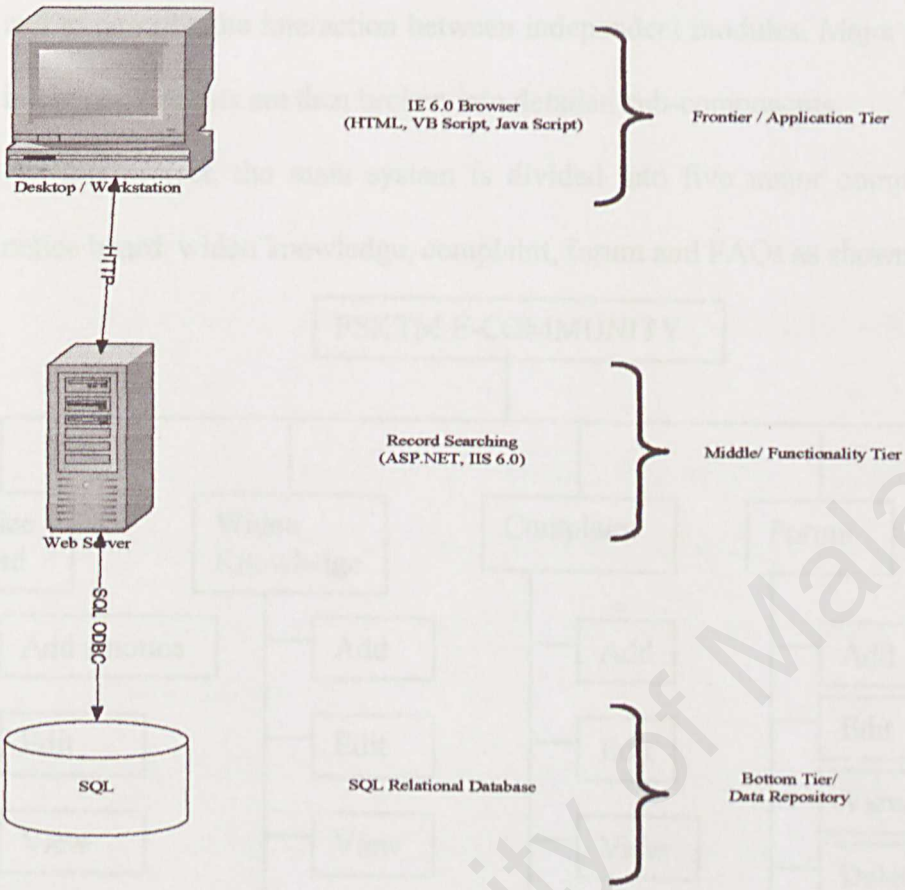


Figure 5.1 Three- tier Client/Server Architecture

5.3 Functional Design

5.3.1 Structure Chart

The structure chart shows all the relation between modules in the FSKTM e-community. It used to identify the activities that make up the system and to model the program structure. Structure chart is used to depict high-level abstraction of this project

and to describe the interaction between independent modules. Major functions from the initial components are then broken into detailed sub-components.

For this project, the main system is divided into five major components, which are notice board; widen knowledge, complaint, forum and FAQs as shown as below:

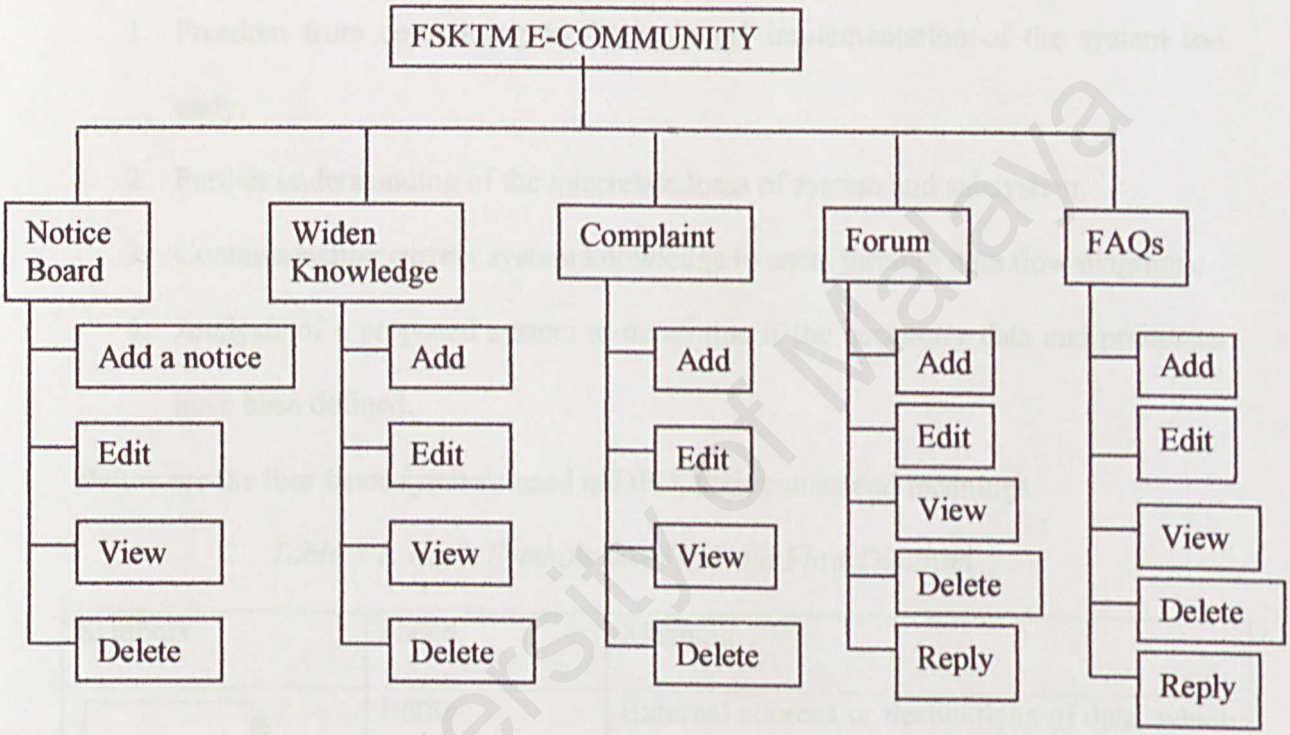


Figure 5.2: structure chart of FSKTM E-Community

5.3.2 Data Flow Diagram

Data Flow Diagram (DFD), which graphically characterize data processes and flow diagrams depict the broadest possible overview of the system inputs, processes, and outputs, which correspond to the data movement through the system.

Objectives of data flow diagram are:

1. To show the data movement between the system and the environment.

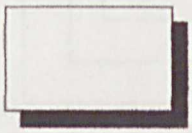
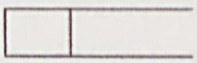
2. To graphically document the boundaries of the system.
3. To provide a hierarchical functional breakdown of the system.
4. To aid the communication.

Advantages of data flow diagram are:

1. Freedom from committing to the technical implementation of the system too early.
2. Further understanding of the interrelatedness of system and subsystem.
3. Communicating current system knowledge to users through data flow diagrams.
4. Analysis of a proposed system to determine if the necessary data and processes have been defined.

Below are the four basic symbols used in DFD, their names and meanings.

Table 5.1: Basic Symbols Used in Data Flow Diagram

Symbols	Name	Meaning
	Entity	External sources or destinations of data, which may be people, programs, organizations, or other entities interact with the system but are outside its boundary.
	*Data store*	Here data ate stored or referenced by a process in the system. The data store may represent computerized or non-computerized devices.
	Flow of data	Data move in a specific direction from an

		origin to a destination in the form of document, letter, or virtually any other medium.
	Process	People, procedures, or devices that use or produce transform data. The physical component is not identified.

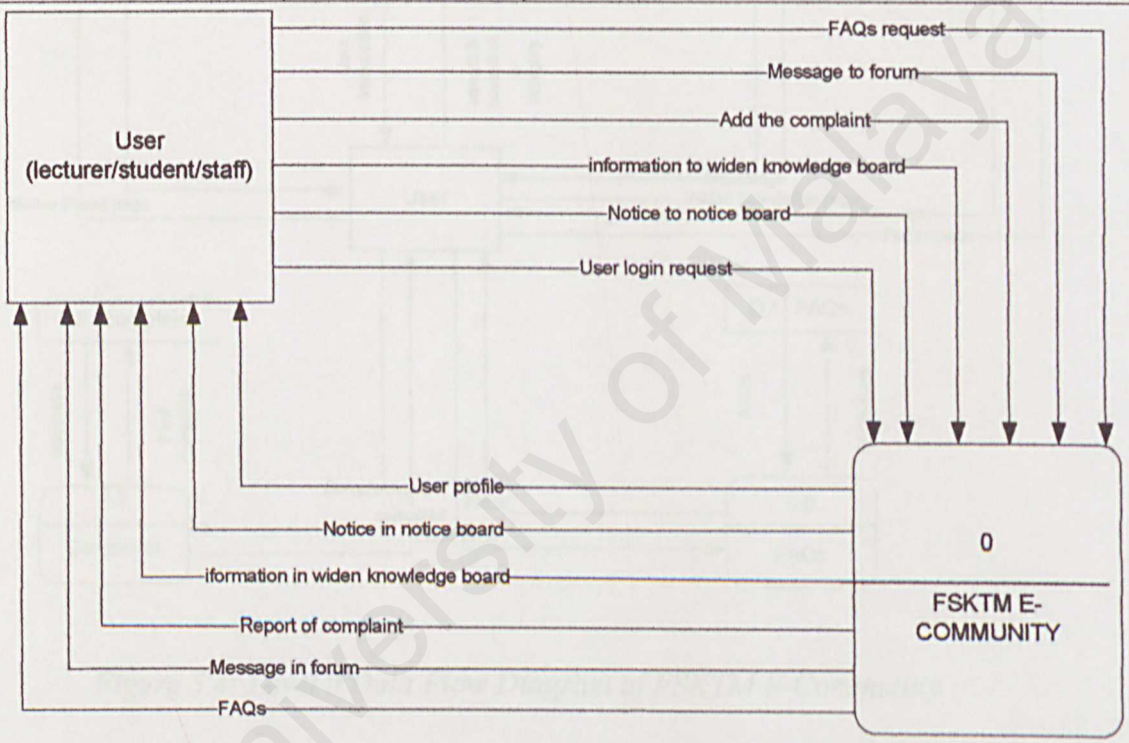


Figure 5.3: Content Diagram of FSKTM E-Community

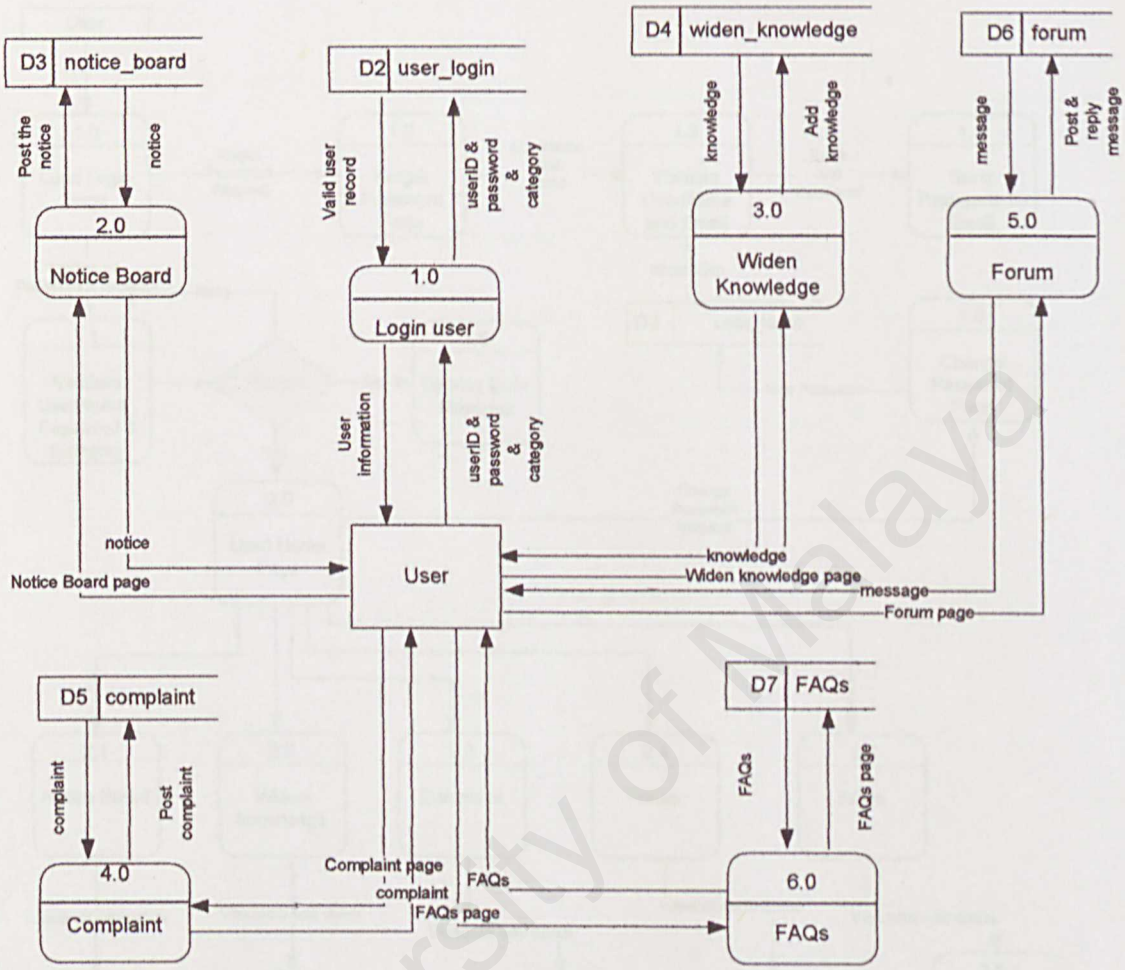


Figure 5.4: Level 0 Data Flow Diagram of FSKTM E-Community

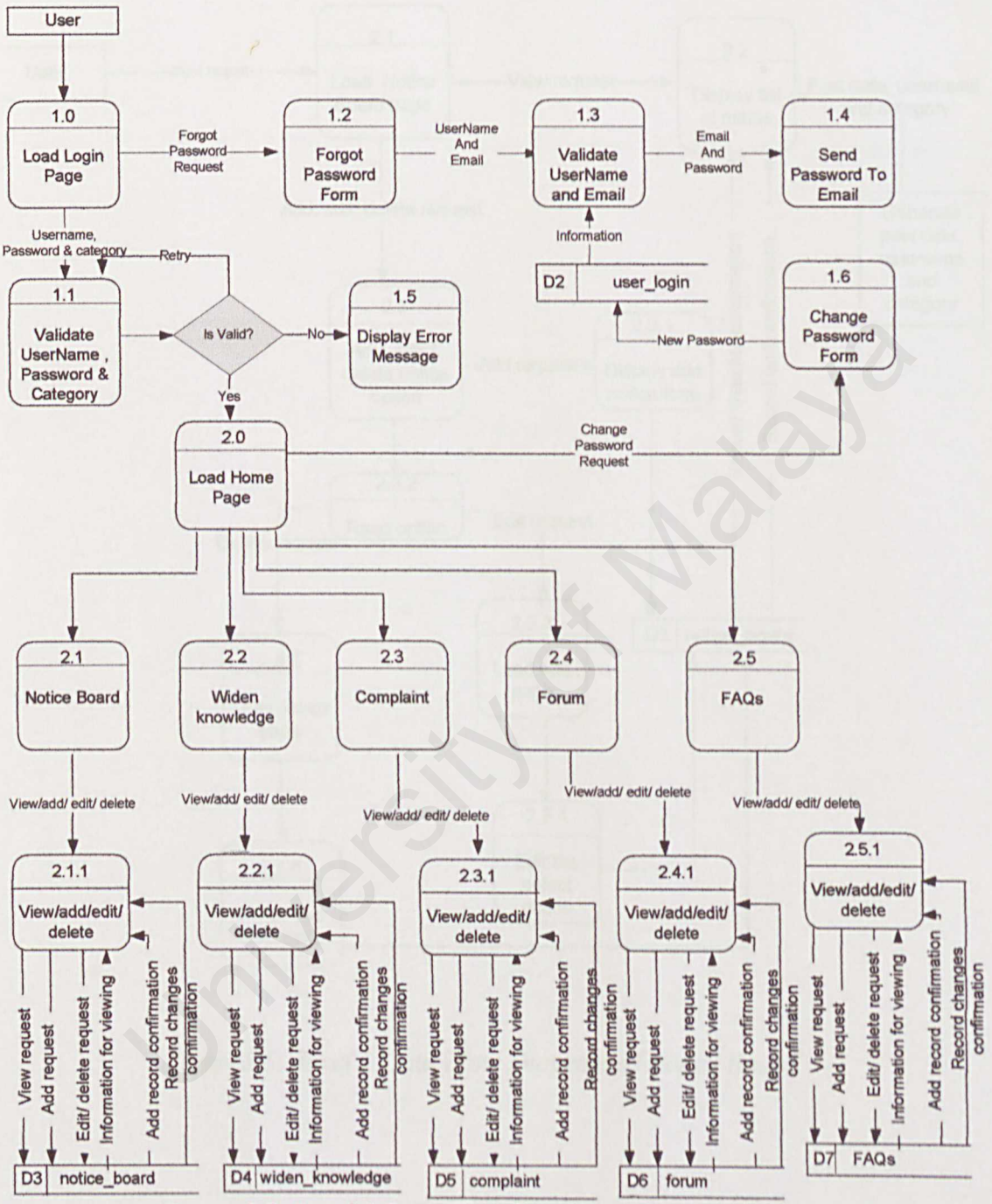


Figure 5.5: Level 1 Data Flow Diagram of User Login

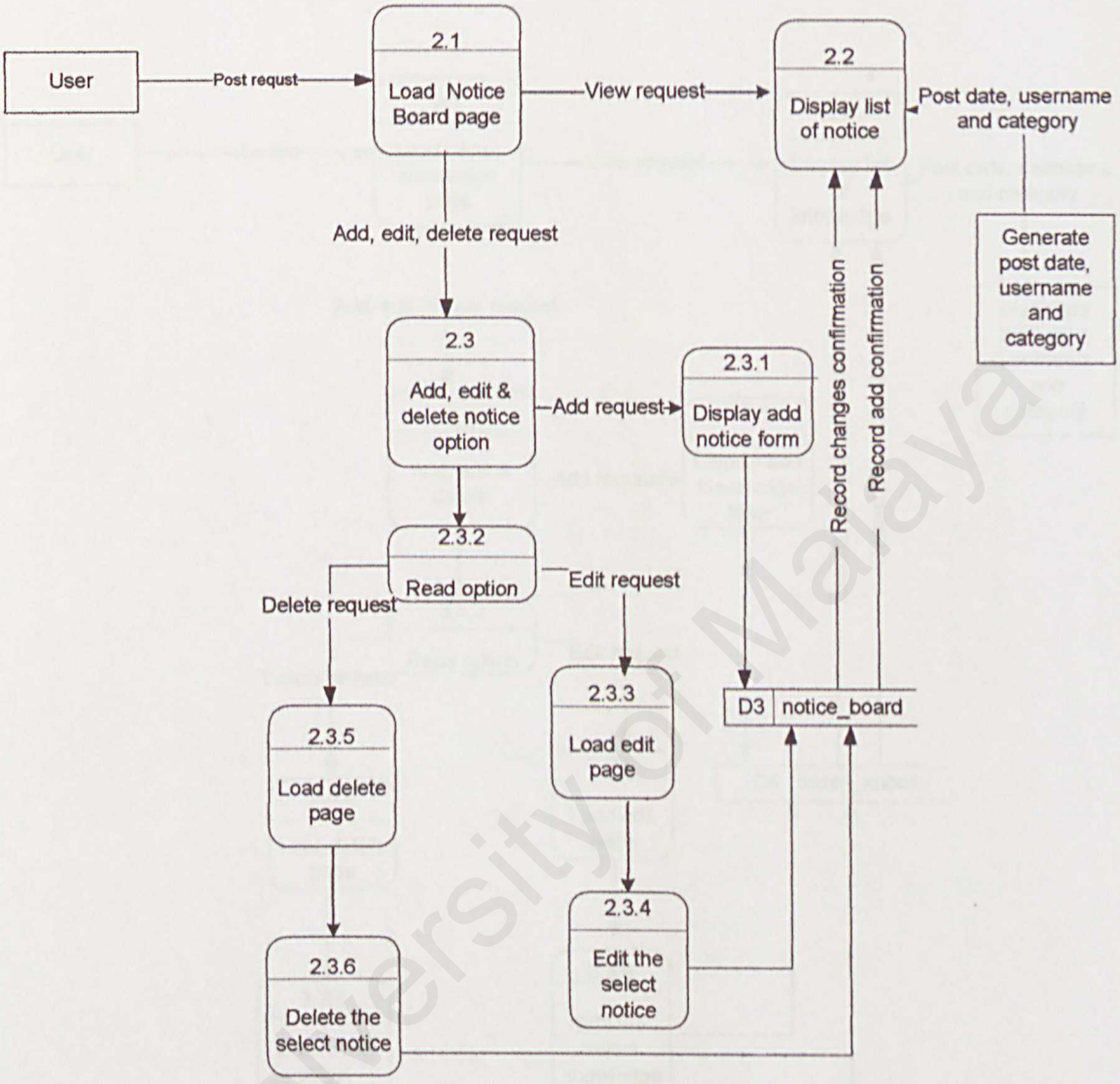


Figure5.6: level 1 Data Flow Diagram of Notice Board

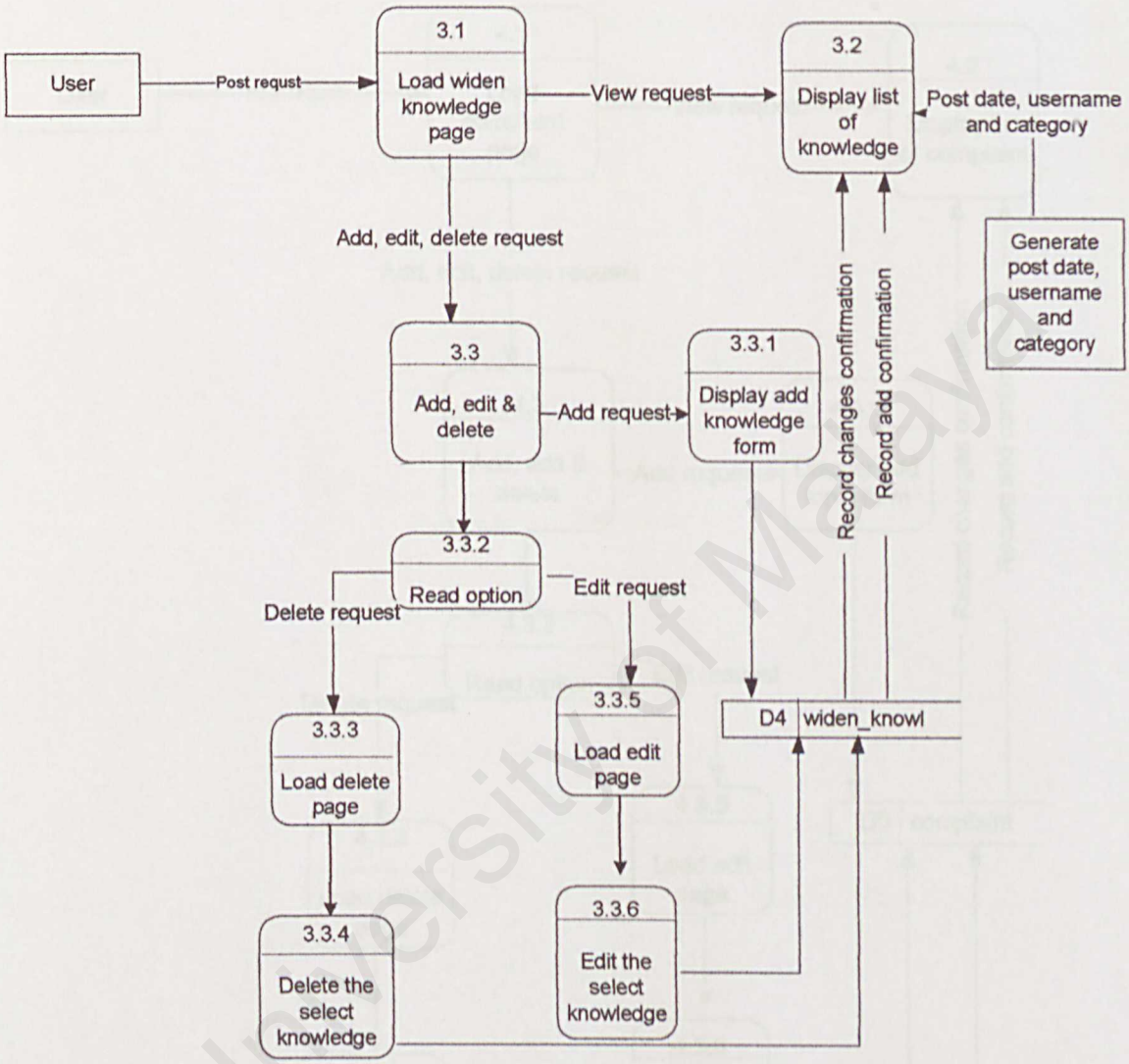


Figure5.7: level 1 Data Flow Diagram of widen knowledge

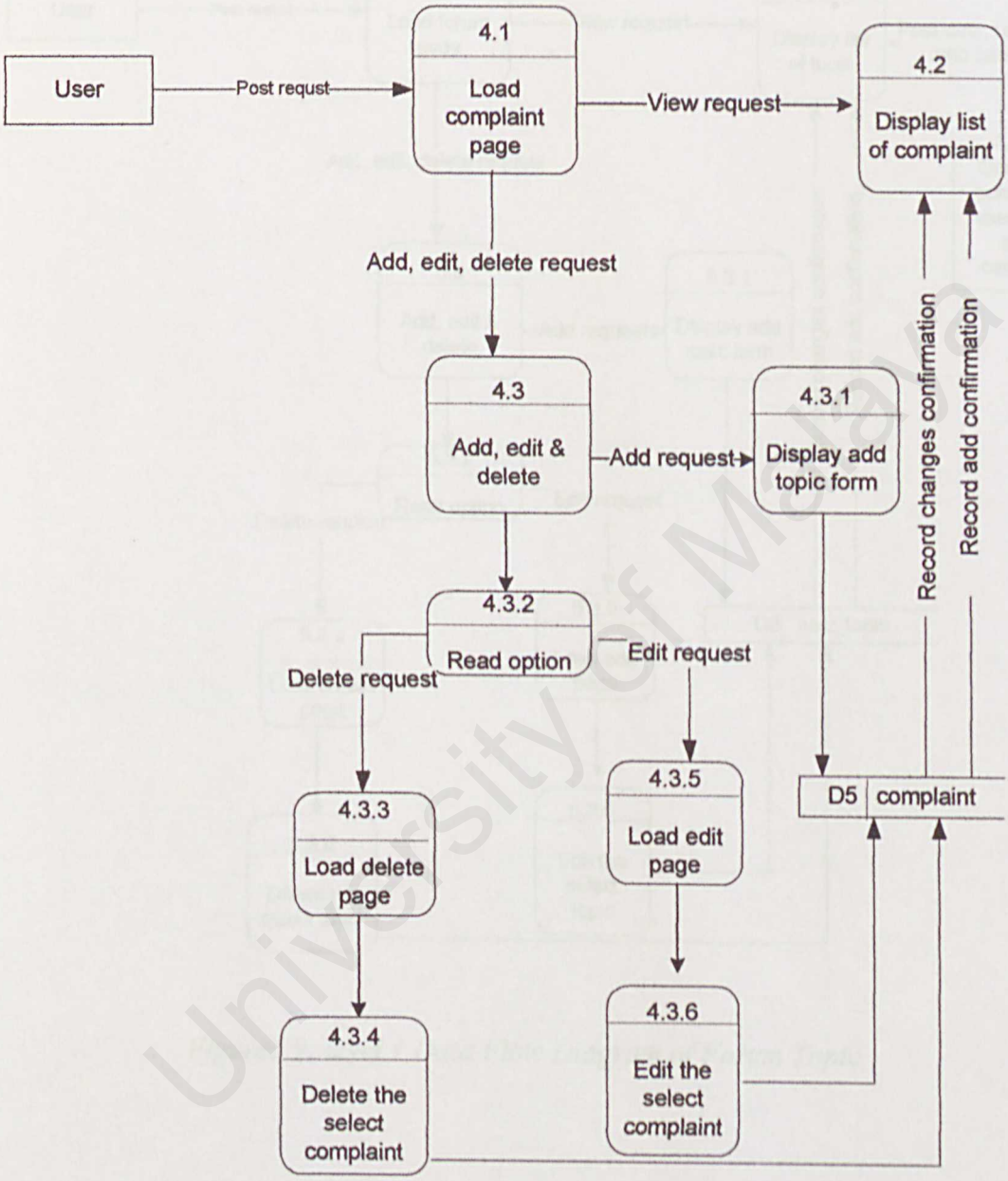


Figure 5.8: Level 1 Data Flow Diagram of complaint

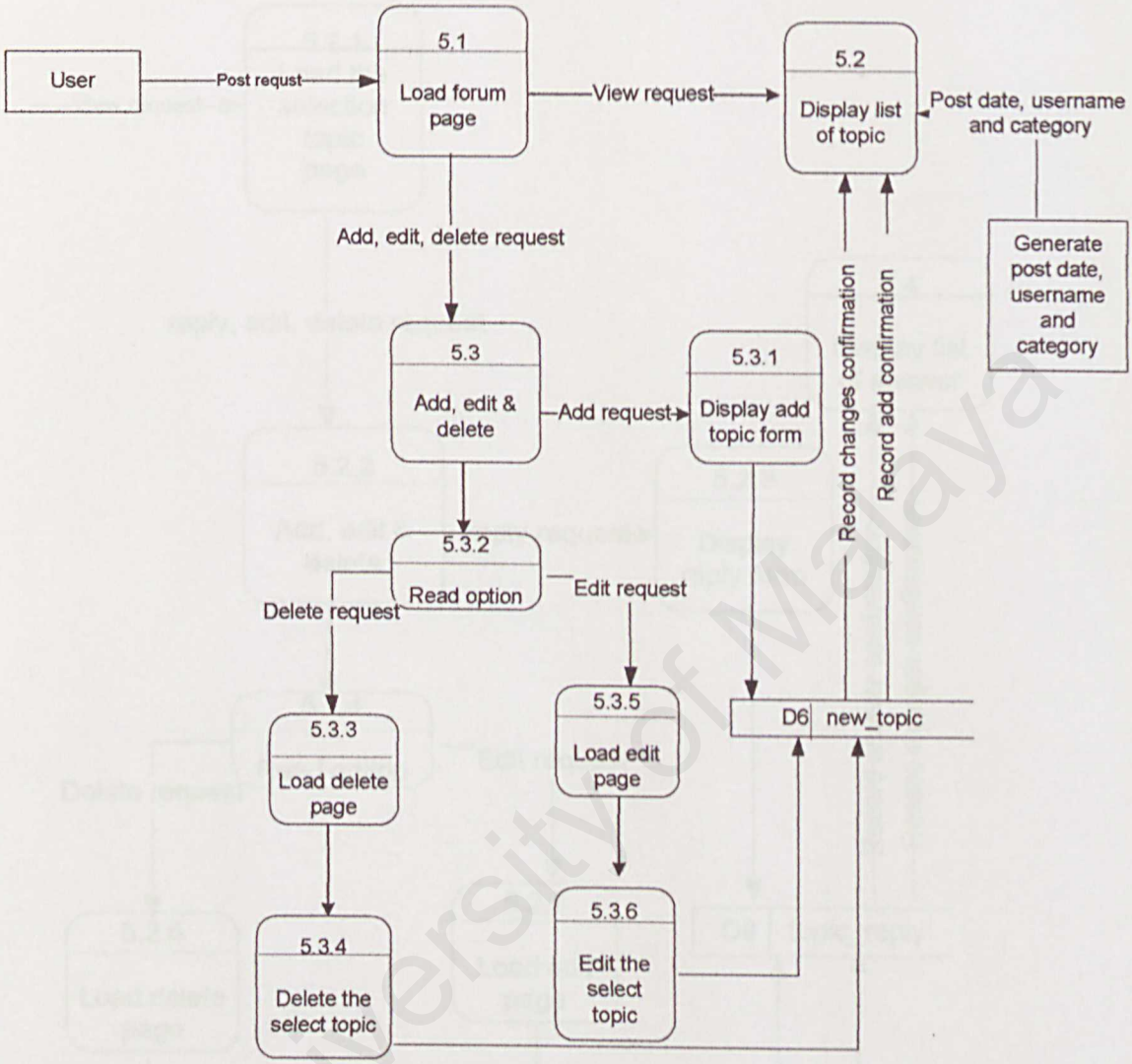


Figure5.9: level 1 Data Flow Diagram of Forum Topic

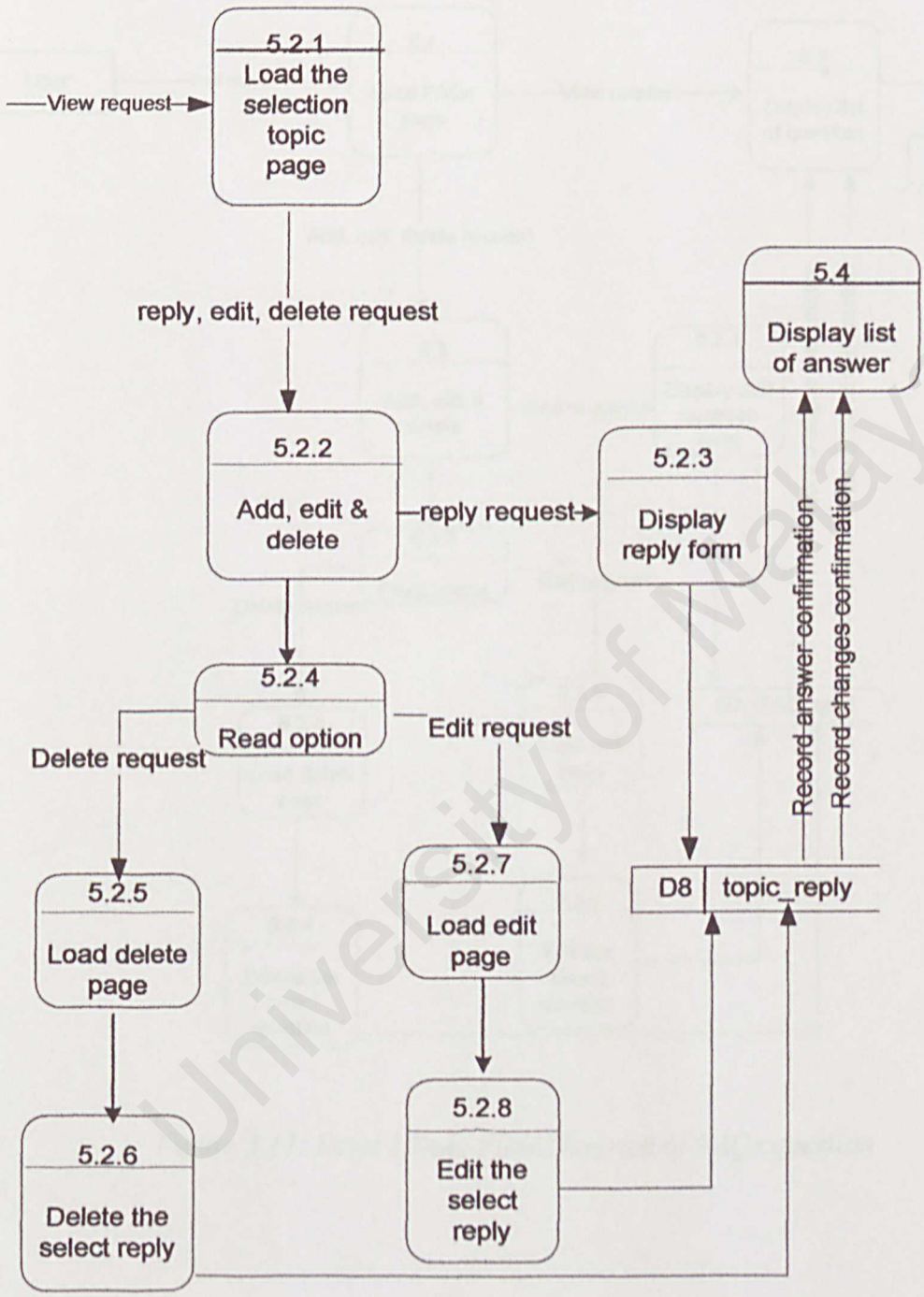


Figure5.10: level 2 Data Flow Diagram of Topic Reply

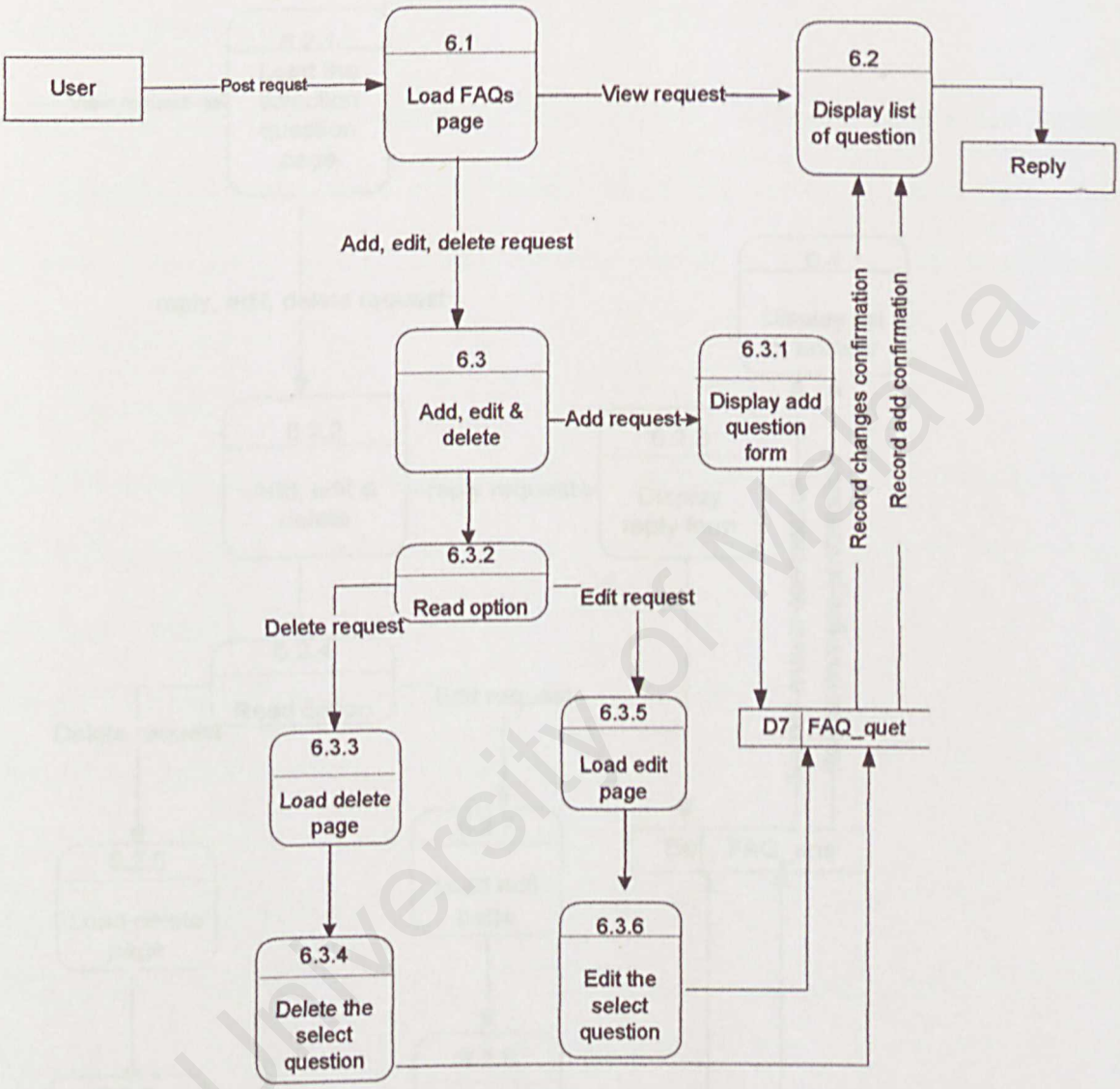


Figure 5.11: Level 1 Data Flow Diagram of FAQs question

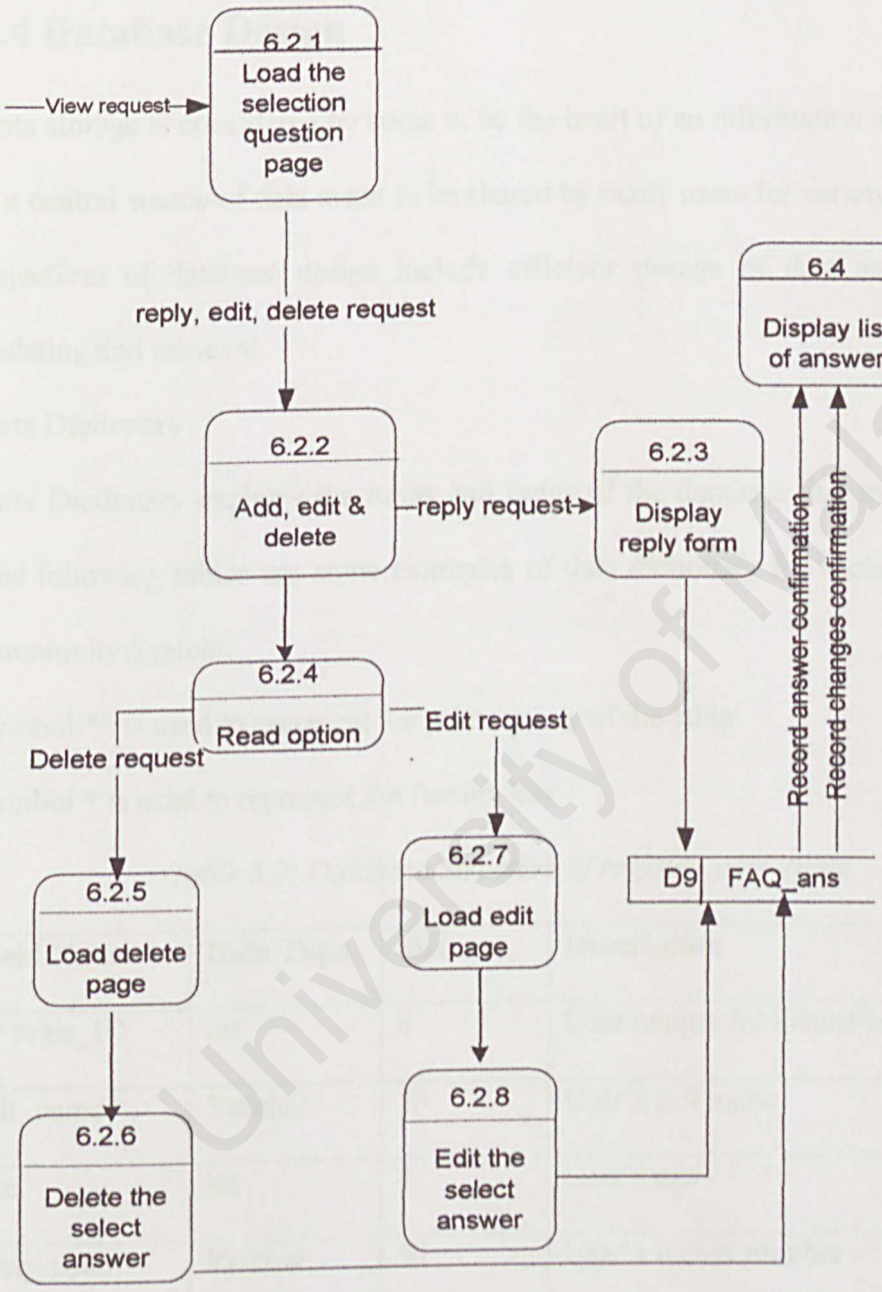


Figure 5.12: Level 2 Data Flow Diagram of FAQs Answer

5.4 Database Design

Data storage is considered by some to be the heart of an information system. A database is a central source of data mean to be shared by many users for variety applications. The objectives of database design include efficient storage of data as well as efficient updating and retrieval.

Data Dictionary

Data Dictionary explains the items and fields of the database that used in this project. The following tables are some examples of data dictionary for sections of FSKTM e-community System.

Symbol ** is used to represent the primary key of the table

Symbol * is used to represent the foreign key

Table 5.2: Database Structure of register_user Table

Field Name	Data Type	Size	Description
** regis_ID	Int	4	User unique for identification
full_name	Varchar	50	User's full name
age	Int	4	User's age
user_name	Varchar	50	User's matrix number
password	nvarchar	10	User's login password (characters or integer, no more that 8 characters)
gender	Varchar	10	User's gender (M = Male, F = Female)
occupation	Varchar	50	User's occupation

email	varchar	100	User's email address

Table 5.3: Database Structure Of User_login Table

Field Name	Data Type	Size	Description
** user_ID	Int	4	User unique for identification
user_Name	Varchar	50	User login name
password	nvarchar	10	User password
category	Varchar	50	Category of user
*regis_ID	Int	4	User unique for identification

Table 5.4: Database Structure of notice_board table

Field Name	Data Type	Size	Description
**notice_ID	int	4	Number used to uniquely define every notice
notice_title	Varchar	100	Notice that be announce
author	Varchar	50	Name of person who doing the announcement
*user_ID	Int	4	User unique for identification
create_date	Date	8	Date when the notice is inserted.

Table 5.5: Database Structure of widen_knowl table

Field Name	Data Type	Size	Description
**knowl_ID	int	4	Number used to uniquely define every new
knowl_content	Varchar	5000	Content of the information

author	Varchar	50	Name of person who share the knowledge.
create_date	Date	8	Date when the new is inserted

Table5.6: Database Structure for complaint table

Field Name	Data Type	Size	Description
**complaint_ID	Int	4	Number used to uniquely define every complaint
Complaint_title	Varchar	5000	Type of the complaint.
post_Date	Date	8	Date submit the complaint

Table 5.7: Database Structure of new_topic table

Field Name	Data Type	Size	Description
**Subject_ID	int	4	Number used to uniquely define every subject
Subject	Varchar	500	Generated by using SQL function
*Categ_ID	Int	4	Integer number used to match the key from the Forum_category table to form the primary key for forum new Posting table
Author	Varchar	50	Name user to post the message
Message	Varchar	2000	Message context
No_reply	Int	4	Number to reply
Post_date	Date	8	Date when submit the post

Table 5.8: Database Structure for topic_reply table

Field Name	Data Type	Size	Description
**Reply_ID	Varchar	50	Varchar used to uniquely define every reply
*Subject_ID	Int	4	Number used to uniquely define every subject
Author	Varchar	50	Name of person who reply the message
Reply_msg	Varchar	5000	Reply message context
Reply_Date	Date	8	Date when message is replied

Table 5.9: Database Structure for FAQ_quest table

Field Name	Data Type	Size	Description
**FAQ_ID	Int	4	Number of question
question	Varchar	5000	Question that ask by user
post_Date	Date	8	Date when submit the question

Table 5.10: Database Structure for FAQ_answer table

Field Name	Data Type	Size	Description
**ans_ID	Int	4	Answer ID
Answer	Varchar	5000	Answer of the question.
*FAQ_ID	Int	4	Number of question

5.5 User Interface Design

User interface design is concerned with the dialogue between a user and the computer. It is concerned with everything from starting the system or logging into the system to eventual presentation of desired outputs and inputs.

Interface that was design much be user friendly. It is because users will no longer spend their time learning the function of each button or each item of the interface. A good interface will improve the effectiveness and efficiency of the usage of the system. Below are the interfaces of the FSKTM E-Community web based system.

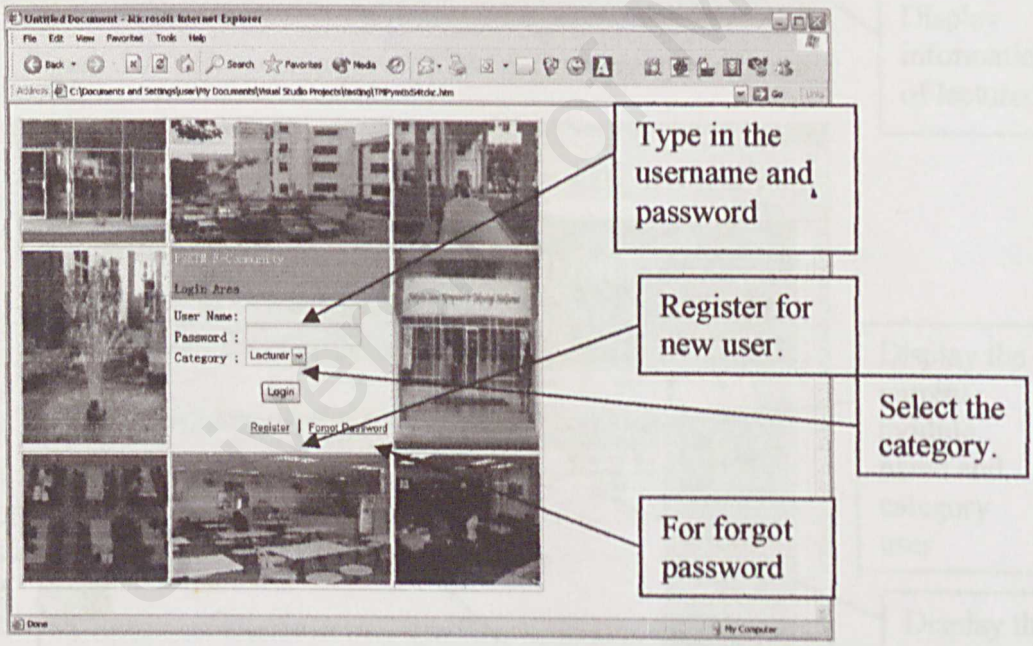


Figure 5.13: login page of FSKTM E-Community web page

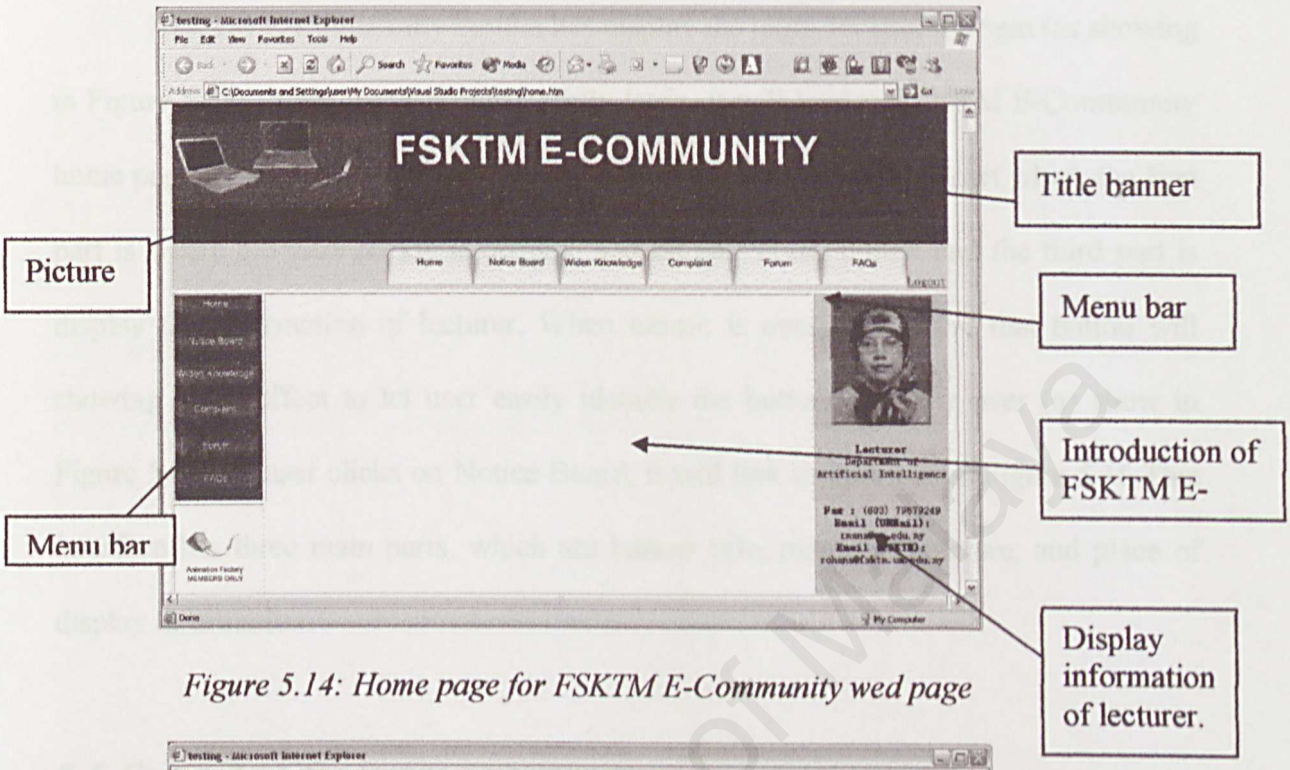


Figure 5.14: Home page for FSKTM E-Community wed page

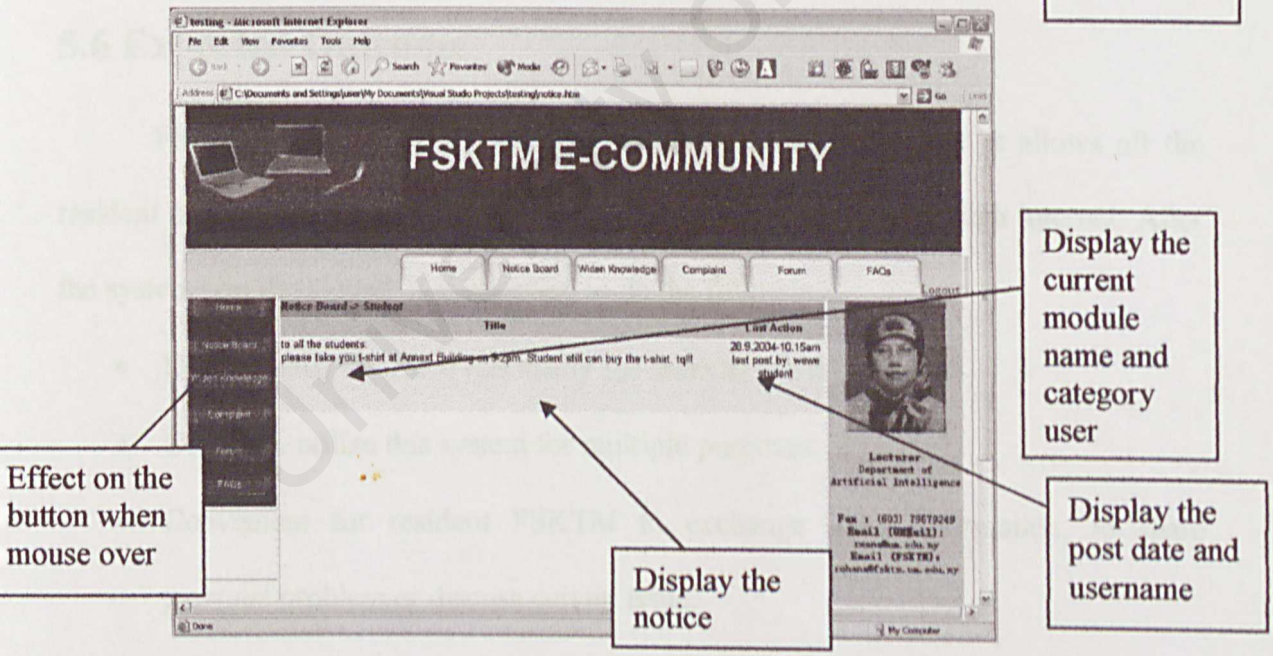


Figure 5.15: Notice Board for FSKTM E-Community web page

FSKTM E-Community system has display the login for user to login (as showing in Figure 5.13). After user has successfully login, it will load to FSKTM E-Community home page (as showing in figure 5.14). Home page has a three main part which the first part is where the information is display, second part is the button and the third part is display the information of lecturer. When mouse is over the button, that button will showing some effect to let user easily identify the button that they over (as show in Figure 5.15). If user clicks on Notice Board, it will link to interface at Figure 5.15.This interface has three main parts, which are banner title, menu bar, picture, and place of display information.

5.6 Expected Outcome

FSKTM E-Community system is online community system. It allows all the resident of FSKTM can communicate together without bordered through internet. After the system was developed, it is expected to do the following:-

- User-friendly interface that easily for users to use this system.
- Users can utilize this system for multiple purposes.
- Convenient for resident FSKTM to exchange idea, information, to share personal problem or discuss certain issue.
- Users can ask the question about the problem that they are facing and answer other users' question.
- Resulted a reliable web-based system and with minimum errors during the system running period.

5.7 Summary

System design is the phase that transform user requirement into a working model that can be used as guidance before developing the complete system. The design of this system was carrying out in a few aspects, which are system architecture, system functionality Design, Database Design, and User Interface Design. It will help us develop the system easily, faster and in correct way.

CHAPTER 6
SYSTEM IMPLEMENTATION & DEVELOPMENT

Chapter 6: System Implementation and Development

6.1 Introduction

After system design phase determine the functionality of the system, the next process is implementation phase. System implementation and development is a process that converts the system requirements and designs into program codes. That mean design model of FSKTM E-Community system is transformed into reality in this phase. In order to achieve requirements for the system, the appropriate tools and language are needed to code the program.

System implementation and development is started from determine the hardware and software that to be used. Development software tools would first be installed into the machine. Then, process of coding is started where it took most of time in development the system. Simultaneously, testing and debugging also is carried out.

In this chapter, it will briefly describes process and techniques of transfer the system design into workable modules and programming code, and setting up the system in the same environment where it will be used.

In this chapter, it will briefly describes process and techniques of transfer the system design into workable modules and programming code, and setting up the system in the same environment where it will be used.

6.2 System Implementation

6.2.1 Implementation Environment

Implementation environment has certain impact on development of the system. Developer must be very careful in choosing the tools that to be used in system. It is because using the suitable tools will help to speed up the system development. Besides, it also determines the success of the project. If have any error or mistake in this phase, it will affect the performance of whole system.

At the following part, it will briefly describe the hardware and software tools that used to development and documentation the system.

6.2.1.1 Hardware Requirement

The hardware configurations used for developing the system are:

200 MHz Pentium Processor

256 MB RAM

52x CD-ROM Drive

6.00 GB Hard Disk Drive

Others standard desktop PC accessories such as keyboard, mouse, monitor, network cards and so on.

6.2.1.2 Software Tool Requirement

During FSKTM E-Community system development, a vast array of software tools was used. Software tools for development of FSKTM E-Community system are briefly described in Table 6.1.

Table 6.1: Summary of software tools for development FSKTM E-COMMUNITY system

Software	**Purpose**	**Description**
Microsoft Windows XP Professional	Development Environment System Requirement	Operating System (OS)
Microsoft Visual Studio .NET Framework	System Development	Development tools for coding the web pages
Microsoft SQL server 2000	Database Design	Database design, construction and implementation for data storage and manipulation
Microsoft Internet Information Service	Web Server	Web Server Host
ASP.NET	System Development	Programming language to coding web pages
VB.NET	System Development	Programming language to coding web pages
SwishMax	Interface Design	Create animation in the banner
Adobe Photoshop 7.0	Interface Design	Interface images
Macromedia Dreamweaver MX	User Interface Design	Designing the header of web pages, button creating

Internet Explore 6.0	System Development	Web Browser for viewing the web pages
Microsoft Word 2003	Documentation	Design and writing report documentation

Operating System

Microsoft Windows XP Professional was the platform or operating system that chosen for develops FSKTM E-Community system. It is because performance of windows XP as well as the reliability of the operating system architecture, user friendly and good graphic presentation of interface. These features make windows XP become an ideal operating system in future.

Internet Information Server (IIS)

Create a virtual directory

Microsoft Internet Information Service (IIS) was the web server for develop FSKTM E-Community system. IIS is a built-in the Microsoft windows XP. It is transmits information by using Hypertext Transfer Protocol (HTTP). IIS is tightly integrated with the windows XP professional in a number of ways. This resulting web page serving become faster. IIS is very efficient and simple to use. The additional functions of this web server make the progress of development for this project faster. All users can access the application through http://localhost/. Here is a step-by-step process of create of a virtual directory.

1. Click Start; control Panel, Administrative Tools, and Internet Information Service.
2. Under the Internet Service Manager, right click in 'Default Web Site'. Under 'New ', choose 'Virtual Directory'

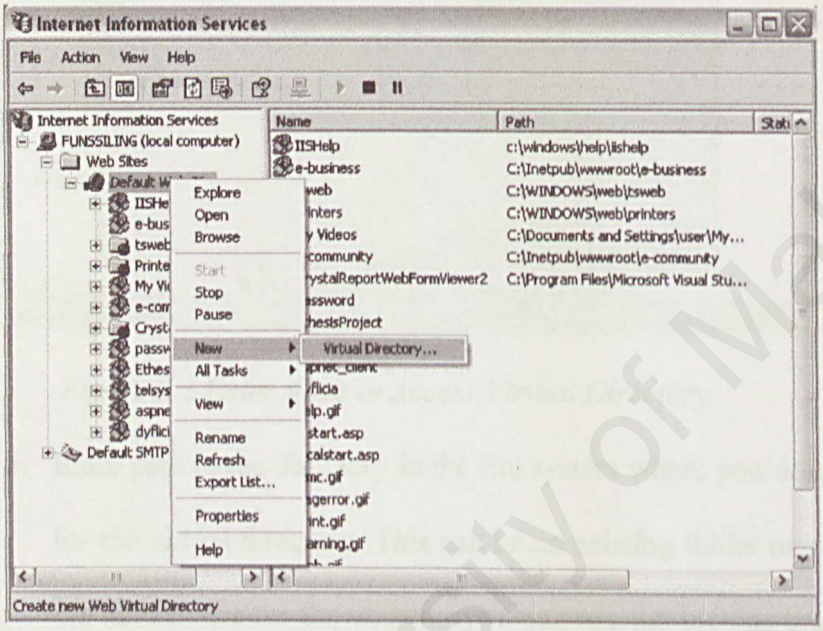


Figure 6.1 Create of Virtual Directory

3. Provide the name alias (name) for the new virtual directory. This name will be used to access the content in the virtual directory from a Wed browser. For this example, use the name e-business. Click Next.

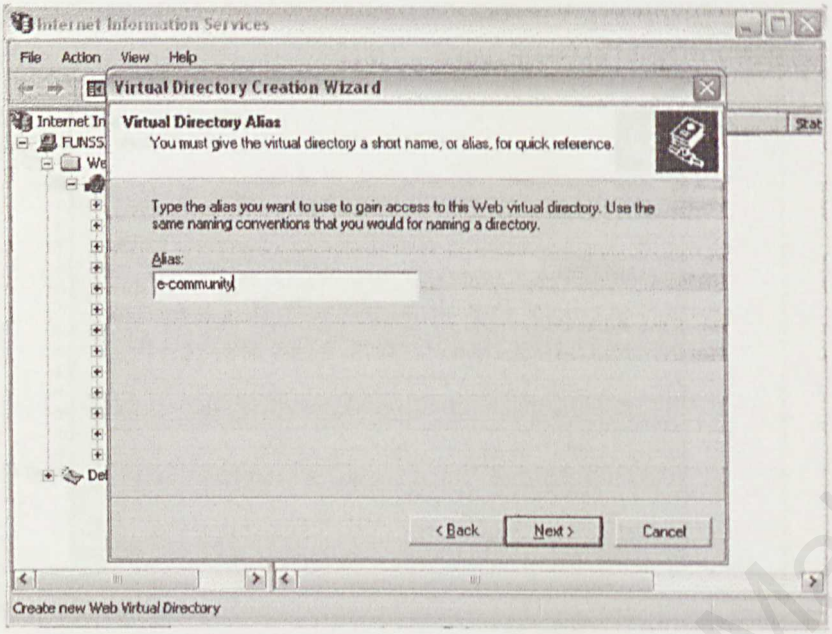


Figure 6.2 Enter Alias to Access Virtual Directory

4. Enter path to the directory in the file system where you'd like to keep the content for the virtual directory. This can be an existing folder or you've already created the new folder for the content, you can use the browse button to find the folder that provides a name to access the path contain the content. The content to publish is located in C drive, named C:\Inetpub\wwwroot\e-community. Click Next.

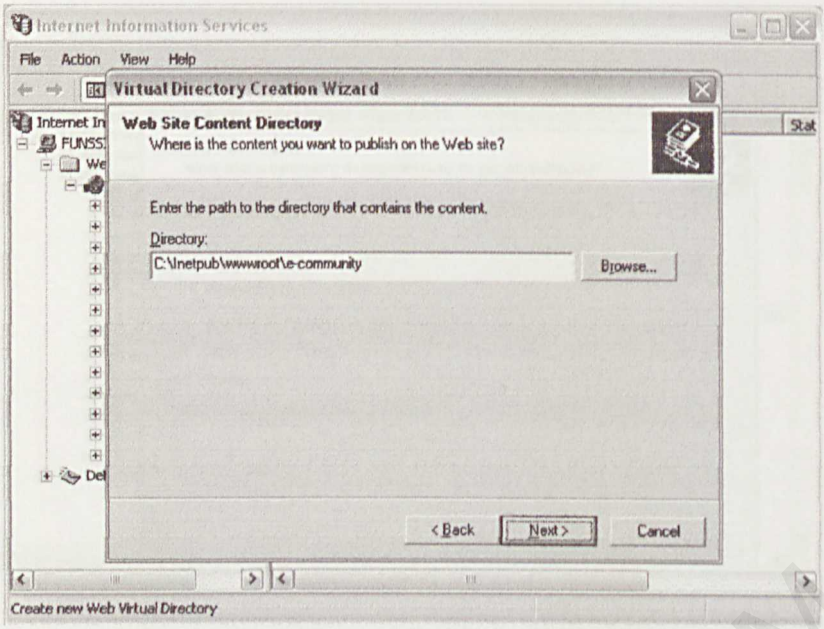


Figure 6.3Enter Path of Directory

5. Specify the access permissions for this virtual directory. In order to maintain security, just leave the default settings, whereby 'Read' and 'Run scripts (such as ASP)' are clicked. If this virtual directory is accessed only by the developer of the system or by a trusted source, then click on the rest of the options, depending on which is applicable.

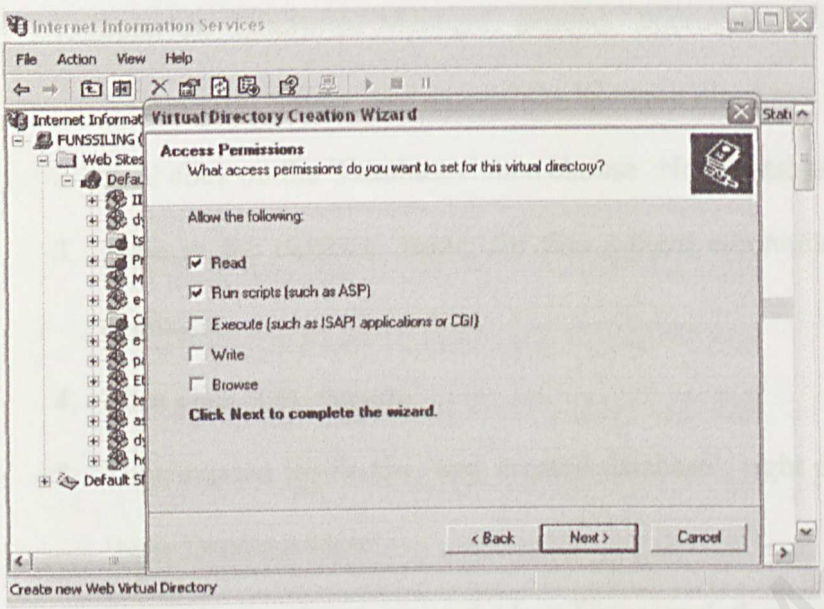


Figure 6.4 Set Access Permissions

6. Click on 'Finish' once every detail is confirmed.

Create Database

Microsoft SQL server 2000 was the database server that was chosen in FSKTM E-Community development. It is used for database design, construction and implementation for data storage and manipulation. SQL server 2000 is suitable to develop FSKTM E-COMMUNITY system because storage of this database is bigger. Besides, SQL server 2000 has many functions that can use in develop FSKTM E-Community system, such as auto-grow features, new storage engine, full-text index table, and so on.

After the database server was installed, a new database was created. Microsoft SQL Server 2000 Enterprise Manager will be used to store the new database in this system. For this project, the shared database is named **e-community.** The step to create new database will be showed below:

1. open the Enterprise Manager, expend 'Microsoft SQL Server' , next expand 'SQL Server Group 'and expend the '(Local)(Windows NT) '
2. right click on the 'Databases' then choose 'New Database'
3. Type in the database name, for this system e-community is the name of the database.
4. Then click 'OK' button.
5. Then expend inside the 'new created database', right click on 'Users' to create 'New Database User'.
6. Enter the Login Name and User Name and then assign the Database Role membership for the user created.

Accessing Databases Programmatically

Before you can open the database connection, you need to set the application at System Configuration which contains classes for working with configuration files (Web Config files). You need to set the name of database connection, server name, and name of database, userID and password like the example below.

```
<appSettings>
<add key="DBConnection" value="server=FUNSSILING;database=e-
community;uid=sa;pwd=" />

<add key="versionNumber" value="e-community Prototype Version 0.2
(Build 190904)" />

      </appSettings>
```

Web Application Development Tools

Microsoft Visual Studio .NET Framework was the main development tools that used in development of FSKTM E-Community system. Any text editor in Microsoft Visual Studio .NET can use to create ASP.NET code in web form. It provides a nice highlight, wizards, and also helps files. Besides Microsoft Visual Studio .NET Framework, Microsoft Dreamweaver and SwishMax also used in develop FSKTM E-Community system.

Program Coding

Active Server Page .NET (ASP.NET) was the web programming code that chosen for develop FSKTM E-Community system. ASP.NET is almost as efficient as writing code directly to the server's application program interface. It is runs as a server and can take advantages or multithreaded architectures. User interface creation such as form, table also used the ASP.NET.

Besides ASP.NET, VB.NET was also used to script the server side scripting and client side scripting

Graphic Creation

Adobe Photoshop 7.0, SwishMax, DreamWear MX was used in develops FSKTM E-Community system. Adobe Photoshop was used to create images. DreamWearer MX is user to create flash button and SwishMax used to create animation in the banner.

Browser

Internet Explorer as web browser is used to view the web pages. That means it used for information about existing similar system and source codes references. Internet browser need to preview the actual size of design and also run the application.

6.3 System Development

6.3.1 Changes of Database

During create a database, a few changes of the database table is done during design phase. This change is done to make the system become more effective. Below is the outcome of the database table after change:

Symbol ** is used to represent the primary key of the table

Symbol * is used to represent the foreign key

Table 6.2 *Database Structure of regis_user Table*

Field Name	Data Type	Size	Description
** User_ID	varchar	50	User name (characters between 6-10)
full_name	Varchar	50	User's full name
age	Int	4	User's age
password	nvarchar	10	User's login password (characters or integer, no more that 8 characters)
Conf_password	nvarchar	10	Re-enter again password(characters or integer that between 6-10 characters)
gender	Varchar	10	User's gender (M = Male, F = Female)
occup	Varchar	50	User's occupation

email	nvarchar	100	User's email address

Table 6.3 *Database Structure of notice_board table*

Field Name	**Data Type**	**Size**	**Description**
**notice_ID	bigint	8	Number used to uniquely define every notice
notice_title	Varchar	100	Notice Title that be announce
Desc_notice	Varchar	8000	Description of the notice
*user_ID	varchar	50	User name (characters between 6-10)
create_date	Date	8	Date when the notice is inserted.
occup	Varchar	50	User's occupation

Table 6.4 *Database Structure of widen_knowl table*

Field Name	**Data Type**	**Size**	**Description**
**knowl_ID	bigint	8	Number used to uniquely define every new
Know_title	Varchar	5000	Title of the knowledge
Know_content	Varchar	8000	Content of the information
*user_ID	varchar	50	User name (characters between 6-10)
create_date	Date	8	Date when the new is inserted

Table 6.5 *Database Structure of type_complaint Table*

**TC_ID	Varchar	50	The parameter to represent the type complaint
Type_complaint	Varchar	100	Name of the complaint

Table 6.6 *Database Structure for complaint table*

Field Name	Data Type	Size	Description
**compl_ID	bigint	8	Number used to uniquely define every complaint
Complaint	Varchar	8000	Type of the complaint.
Post_Date	Date	8	Date submit the complaint
*user_ID	varchar	50	User name (characters between 6-10)
To_user	varchar	50	The name of the staff
suggestion	varchar	500	Suggest to solve the problem
*TC_ID	Varchar	50	The parameter to represent the type complaint

Table 6.7 *Database Structure of new_topic table*

Field Name	Data Type	Size	Description
**Subject_ID	bigint	8	Number used to uniquely define every subject
Subject	Varchar	500	Generated by using SQL function
*Categ_ID	bigint	8	Integer number used to match the key from the Forum_category table to form the primary key for forum new Posting table
Author	Varchar	50	Name user to post the message
Message	Varchar	2000	Message context

No_reply	bigint	4	Number to reply
Post_date	Date	8	Date when submit the post

Table 6.8 *Database Structure of category_forum*

Field Name	Data Type	Size	Description
**category	Varchar	100	Category forum
Post_date	Date	8	Date when submit the post
*user_ID	varchar	50	User name (characters between 6-10)

Table 6.9 *Database structure of thread table*

Field Name	**Data Type**	**Size**	**Description**
**thread_ID	Bigint	8	Number used to uniquely define every subject
Thread	Varchar	500	Write the title of thread
Last_post	Date	8	Date when the thread is post
*User_ID	Varchar	50	Name of person who post the thread
*category	Varchar	100	Category forum

Table 6.10 *Database Structure for reply table*

Field Name	**Data Type**	**Size**	**Description**
**Reply_ID	Varchar	50	Varchar used to uniquely define every reply
*thread_ID	bigInt	8	Number used to uniquely define every subject

*User_ID	Varchar	50	Name of person who reply the message
Reply	Varchar	5000	Reply message context
Last_post	Date	8	Date when message is replied

Table 6.11 *Database Structure for faqs table*

Field Name	Data Type	Size	Description
**Faq_ID	bigint	8	Number of question
question	Varchar	5000	Question that ask by user
post_Date	Date	8	Date when submit the question
*user_ID	varchar	50	Name of the user post the question

Table 6.12 *Database Structure for faqs_ans table*

Field Name	Data Type	Size	Description
**ans_ID	bigint	8	Answer ID
Answer	Varchar	5000	Answer of the question.
*Faq_ID	bigint	8	Number of question
post_Date	Date	8	Date when submit the answer
Post_by	Char	50	Name of user answer the quest

6.3.2 Coding

Process of coding took most time in develop the FSKTM E-Community system. It is a process that translates system requirement and design into programming language. That mean it translates the design representation into a machine-readable form. Microsoft Visual Studio .NET Framework was used to create all modules in FSKTM E-

Community system. Every algorithm that is designed during designing is transformed into line of codes in process of coding.

6.3.2.1 Coding Methodology

During development FSKTM E-Community system, coding methodology that was used is top-down approach and bottom-up approach. Mostly, top-down approach are used in develop FSKTM E-Community system.

Top-down Approach

Top-down approach is a design method in which the modules to be accomplished is broken down into sub modules and each sub modules is the further decomposed into smaller sub modules and so forth. This approach is a good ways of constructing a program eventually the sub program is small enough that can be written in functions. For this approach, it will ensure the important modules will be developed and tested first.

By using this approach, FSKTM E-Community system is divided into several main modules, which are Home, Notice Board, Widen Knowledge, Complaint, Forum and FAQ, Logout. Some of these modules, such as FSKTM E-Community, Login, Search, and Questions and Answers divided again into sub modules. For examples, Login module divided into a few sub modules which are Normal User, Moderator and Administrator. Each of sub modules divided again into smaller sub modules, such as Normal User have profile, submit thesis and upload thesis functions.

Bottom-up Approach

Bottom-up Approach is a design method that starting with coding the lower modules before higher modules is constructed. Higher modules in FSKTM E-

Community system are Home, Normal User, Moderator and Administrator. When each of the modules and sub modules under the Lower modules is coding, Higher modules will be create to link each of the modules together.

Checking Login User

Coding to check the user either already registers as a member. The code will check the user through username and password. If the username and password are not recorded in the database, error message will display and if the username and password have in the database. Then, system will allow the user go to home page. Below is the coding to check the login user:

```
If ds.Tables("regis_user").Rows.Count = 0 Then
        lbllogin.Text = "Invalid User"
    Else
        Session("sesName") = ds.Tables("regis_user").Rows(0).Item("full_Name")
        Session("sesUID") = ds.Tables("regis_user").Rows(0).Item("user_ID")
        Session("sesoccup") = ds.Tables("regis_user").Rows(0).Item("occup")
        Response.Redirect("home.aspx")
    End If
End If
```

Figure 6.5: control user login

Adding Data

Coding to insert the data into database is show in figure6.6 below and function to generate new ID for new data is show in figure6.7

```
Private Sub btnSubmit_Click(ByVal sender As System.Object, ByVal e As
System.Web.UI.ImageClickEventArgs) Handles btnSubmit.Click

        If txtTitle.Text = "" Then
            lblMsg.Text = "Please enter a title"
            Exit Sub
        End If
        If txtDesc.Text = "" Then
            lblMsg.Text = "Please enter the description"
            Exit Sub
        End If

        Dim strInsert As String
        Dim cmdNotice As SqlCommand
        Dim ds As DataSet

strInsert = "insert into notice_board(notice_ID, notice_title,
desc_notice, create_date,occup, user_ID) values (@notice_ID,
@notice_title, @desc_notice, @create_date, @occup,@user_ID )"
        cmdNotice = New SqlCommand(strInsert, MyConnection)

        cmdNotice.Parameters.Add(New SqlParameter("@notice_ID",
SqlDbType.BigInt, 8))
        cmdNotice.Parameters("@notice_ID").Value = generateID()
        cmdNotice.Parameters.Add(New SqlParameter("@notice_title",
SqlDbType.VarChar, 5000))
        cmdNotice.Parameters("@notice_title").Value = txtTitle.Text
        cmdNotice.Parameters.Add(New SqlParameter("@desc_notice",
SqlDbType.VarChar, 8000))
        cmdNotice.Parameters("@desc_notice").Value = txtDesc.Text
        cmdNotice.Parameters.Add("@occup", SqlDbType.VarChar,
50).Value = Session("sesoccup")
        cmdNotice.Parameters.Add(New SqlParameter("@create_date",
SqlDbType.DateTime, 8))
        cmdNotice.Parameters("@create_date").Value =
DateTime.Now.ToString
        cmdNotice.Parameters.Add("@user_ID", SqlDbType.VarChar,
50).Value = Session("SESName")

        MyConnection.Open()
        cmdNotice.ExecuteNonQuery()
        Response.Redirect("ViewNotive.aspx")
        MyConnection.Close()

    End Sub
```

Figure 6.6: coding add data into database

```
  Function generateID()
        Dim newID As Integer
        Dim idCommand As SqlCommand = New SqlCommand("SELECT top 1
Notice_ID FROM notice_board ORDER BY notice_ID DESC", MyConnection)
        Dim dr As SqlDataReader

        MyConnection.Open()
 dr =idCommand.ExecuteReader(CommandBehavior.CloseConnection)
        dr.Read()
        If dr.HasRows Then
            newID = dr.GetValue(0) + 1
        Else
            newID = "10000001"
        End If
        dr.Close()
        Return newID

    End Function
```

Figure6. 7: function generate ID

Edit data

```
If Not Page.IsPostBack Then

Dim myCommand As SqlCommand = New SqlCommand("SELECT * FROM
notice_board WHERE notice_ID =" & equest.QueryString("stridpass"),
MyConnection)

            Dim dr As SqlDataReader
            MyConnection.Open()
dr = myCommand.ExecuteReader(CommandBehavior.CloseConnection)
            dr.Read()

            txtTitle.Text = dr.GetValue(1)
            txtDateIn.Text = dr.GetValue(2)
            txtDesc.Text = dr.GetValue(3)
            txtBy.Text = dr.GetValue(4)
            dr.Close()

        End If
Private Sub btnChange_Click(ByVal sender As System.Object, ByVal e As
System.Web.UI.ImageClickEventArgs) Handles btnChange.Click
        Dim strUpdate As String
        Dim cmdUpdate As SqlCommand

        strUpdate = "update notice_board set
notice_title=@notice_title,desc_notice=@desc_notice,create_date=@dateI
n where notice_ID=@notice_ID"
        cmdUpdate = New SqlCommand(strUpdate, MyConnection)
```

```
cmdUpdate.Parameters.Add(New SqlParameter("@notice_title",
SqlDbType.VarChar, 5000))
        cmdUpdate.Parameters("@notice_title").Value = txtTitle.Text

        cmdUpdate.Parameters.Add(New SqlParameter("@desc_notice",
SqlDbType.VarChar, 8000))
        cmdUpdate.Parameters("@desc_notice").Value = txtDesc.Text
        cmdUpdate.Parameters.Add(New SqlParameter("@dateIn",
SqlDbType.DateTime, 8))
        cmdUpdate.Parameters("@dateIn").Value = DateTime.Now.ToString
        cmdUpdate.Parameters.Add(New SqlParameter("@notice_ID",
SqlDbType.BigInt, 8))
        cmdUpdate.Parameters("@notice_ID").Value =
Request.QueryString("stridpass")

        MyConnection.Open()
        cmdUpdate.ExecuteNonQuery()
        Response.Redirect("ViewNotive.aspx")
        MyConnection.Close()
    End Sub
```

Figure6.8 edits the data

View the data

```
Private Sub Page_Load(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles MyBase.Load
        'Put user code to initialize the page here
        Dim ds As DataSet
        Dim MyConnection As SqlConnection
        Dim cmdview As SqlDataAdapter
        'select information from table
Dim strselect As String = "SELECT * FROM widen_know ORDER BY know_ID
DESC"
        MyConnection = New
SqlConnection(System.Configuration.ConfigurationSettings.AppSettings("
DBConnection"))
        cmdview = New SqlDataAdapter(strselect, MyConnection)
        ds = New DataSet

        cmdview.Fill(ds, "widen_know")

        'bind datagrid
        dgViewWideKnow.DataSource =ds.Tables("widen_know").DefaultView
        dgViewWideKnow.DataBind()
    End Sub
```

Figure6.9: coding view data

Delete Data

```
Private Sub dgDelWidceKnow_DeleteCommand(ByVal source As Object, ByVal
e As System.Web.UI.WebControls.DataGridCommandEventArgs) Handles
dgDelWideKnow.DeleteCommand
        strID = CInt(e.Item.Cells(0).Text)

        Dim strdel As String
        Dim cmddel As SqlCommand

        strdel = "delete from widen_know WHERE know_ID = @know_ID"
        cmddel = New SqlCommand(strdel, MyConnection)
        cmddel.Parameters.Add(New SqlParameter("@know_ID",
SqlDbType.BigInt, 8))
        cmddel.Parameters("@know_ID").Value = strID

        MyConnection.Open()
        cmddel.ExecuteNonQuery()
        Response.Redirect("viewWidenKnow1.aspx")
        MyConnection.Close()
    End Sub
```

Figure6.10: coding delete data

6.4 Interface

Interfaces were developed into two types. The first type interface is a common interface as show in figure 6.1 and the second type interfaces were developed for each module to allow users integrate with the system. Each interface that was designs almost the same and divided into three parts, which are header, content and footer as show in figure 6.2. Besides, each of the interfaces for each module has different colour to make the user easily differential the module (refer figure 6.3).

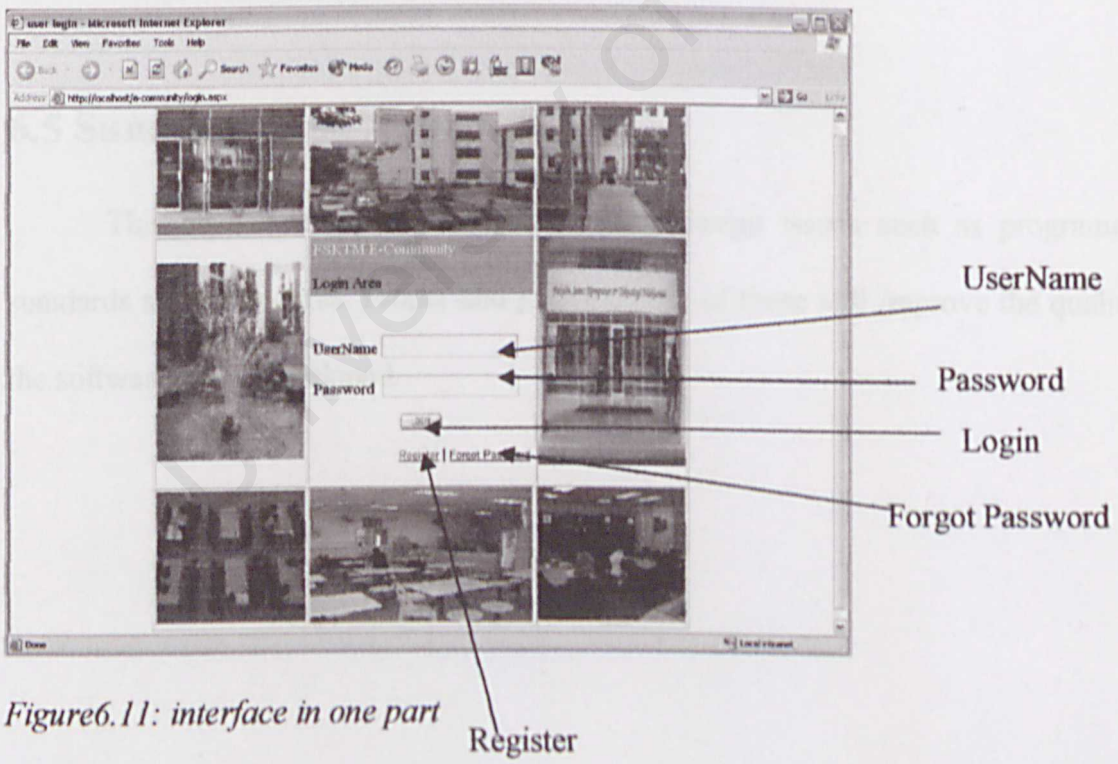


Figure6.11: interface in one part

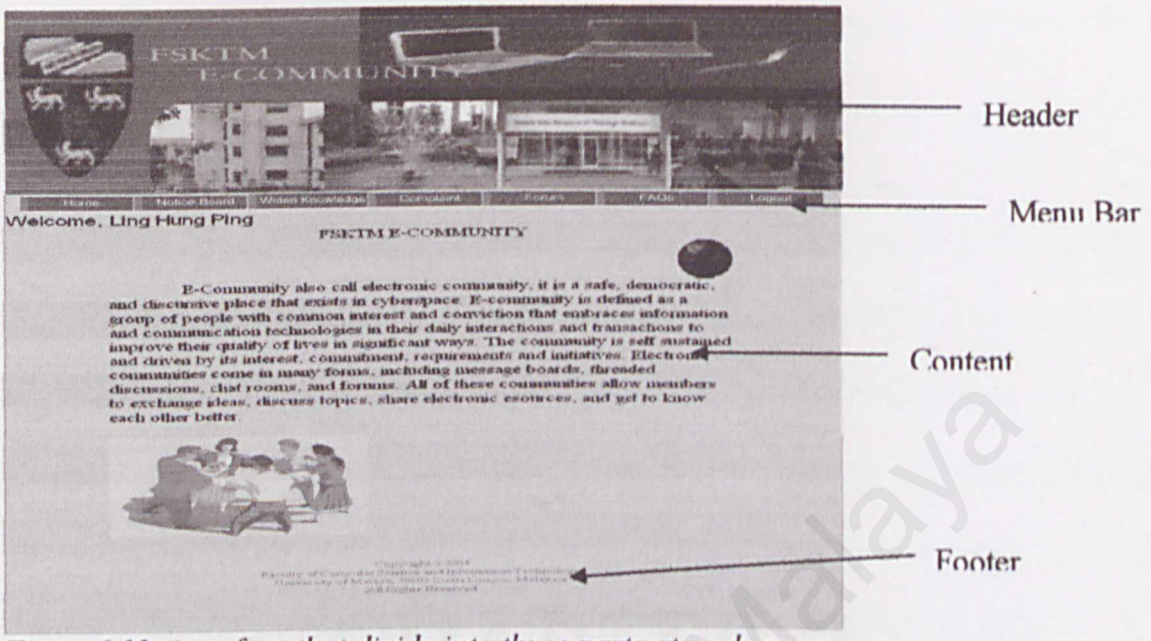


Figure6.12: interface that divide into three parts at each page

6.5 Summary

This chapter explained several program design issues such as programming standards and procedures. Proper and judicious use of these will improve the quality of the software being developed.

CHAPTER 7
TESTING OF PROGRAM

Chapter 7: Testing of Program

7.1 Introduction

Before the system was released to the customer, many types of testing had been done to ensure that the final system performs as what it should be. There are a few modules in FSKTM E-ECOMMUNITY system. Each module is coded and tested separately. After these modules have been tested, it was integrated and tested in a whole system. The tester of the system is not the system designer. They have responsibility to ensure each module is running smoothly and each function is performed perfectly.

Through the testing, it is to make sure whether the interface is self-explanatory or not, or whether the tester know what should be the steps taken to run the system. Improvement was carrying out when tester felt messy and complicated while testing out the system.

The Objectives of the testing are:-

- Testing is a process of program execution with explicit intents to find errors and run–time program bugs.
- An effective test case is one which contains unexpected testing record sets with high probability of detecting undiscovered errors during the program design and development phases.
- A successful test is also not one which uncovers only few expected errors; it is one which constantly provides new challenges to its programmers over time.

There are five testing strategies were conducted for FSKTM E- system, which are:-

- Unit Testing
- Module Testing
- Interface Testing
- Integration Testing
- System Testing

7.2 Unit Testing

Unit testing is a small unit testing that aims at the verification of the smallest unit within a program. This testing is done on individual components of the system to ensure that they operate correctly. Each function is tested independently, without other system components or before the entire application was tested. White box and black box approach was used to carry out unit testing.

7.2.1 White Box

White-box testing also called as glass-box testing. It is a testing that uses the control structure and implementation of the procedural design to derive test cases. Tests are conducted to ensure that the internal operations are performed according to its specifications and all internal components have been adequately exercised.

Using white-box testing methods, programmers are able to derive test cases that:-

- Guarantee that all independent paths within a module have been exercised at least once

- Exercise all logical decision on their true and false sides
- Execute all loops at their boundaries and within their operational bounds
- Exercise internal data structures to ensure their validity

7.2.1.1 Segment Coverage Testing

This type of testing is rechecked the every segment of the code in FSKTM E-COMMUNITY system to ensure that all of coding are supposed to be executed at least once.

For example, system wants to retrieve record of notices from database depending on the selection of the notice by in list of notices record. Testing was done to see whether system was retrieving the correct record from database. The best way is to debug the flow of the codes. When debugging, yellow line will be passes lines of code. If the cursor is bringing near the yellow line, value of the code would be shown in small yellow box. If the value that was showing is correct, that means the codes are performing and running well.

7.2.1.2 Compound Condition Coverage

Codes that have been writing have multiple conditions; every possible combination conditions were tested. For example, there are multiple conditions in the login function that show in the code below. When the users enter their username and password, system will authenticate their identities by checking in the database. If user enters the incorrect username and password, "Invalid User" message will be display.

Otherwise, system will check whether the username, password and the occupation is same in the database for link to the home page.

To check for a certain value that retrieves from database, 'Watch' function has been use. It will display certain value when the code is highlighted and run line of code according to the value.

```
'Incorrect username and password
If ds.Tables("regis_user").Rows.Count = 0 Then
  lbllogin.Text = "Invalid User"
Else
  Session("sesName") = ds.Tables("regis_user").Rows(0).Item("full_Name")
  Session("sesUID") = ds.Tables("regis_user").Rows(0).Item("user_ID")
  Session("sesoccup") = ds.Tables("regis_user").Rows(0).Item("occup")
  Response.Redirect("home.aspx")
End If
End If
```

7.2.1.3 Data Flow Testing

This type of testing is to reflect dependencies which are mainly caused by sequences of data manipulations. For example, user adds the question to the system. Question that has been added by the user will be show out in the view questions list and Edit and Delete question function (refer figure7.1, figure7.2 and figure7.3).

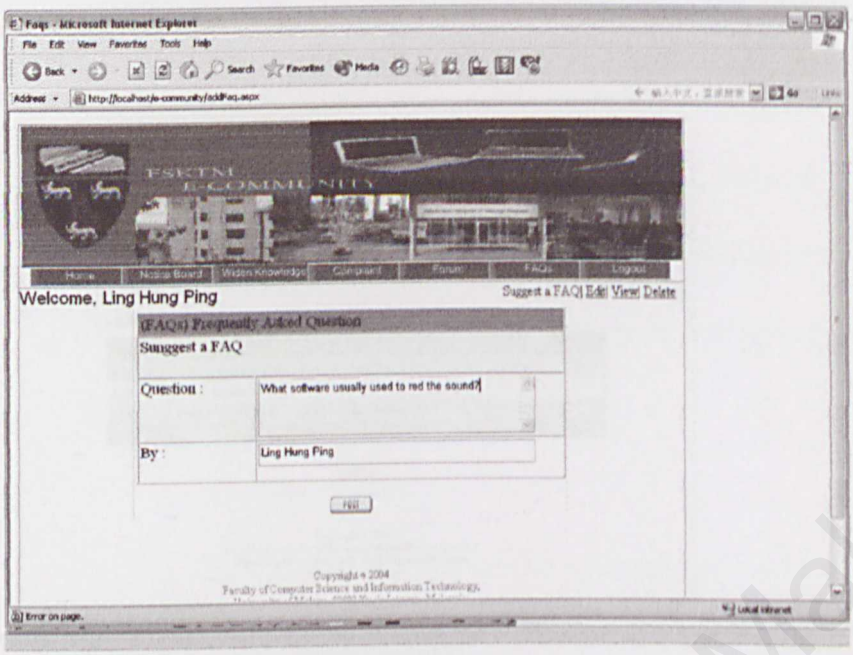


Figure7.1: User add a question at Suggest a FAQs function

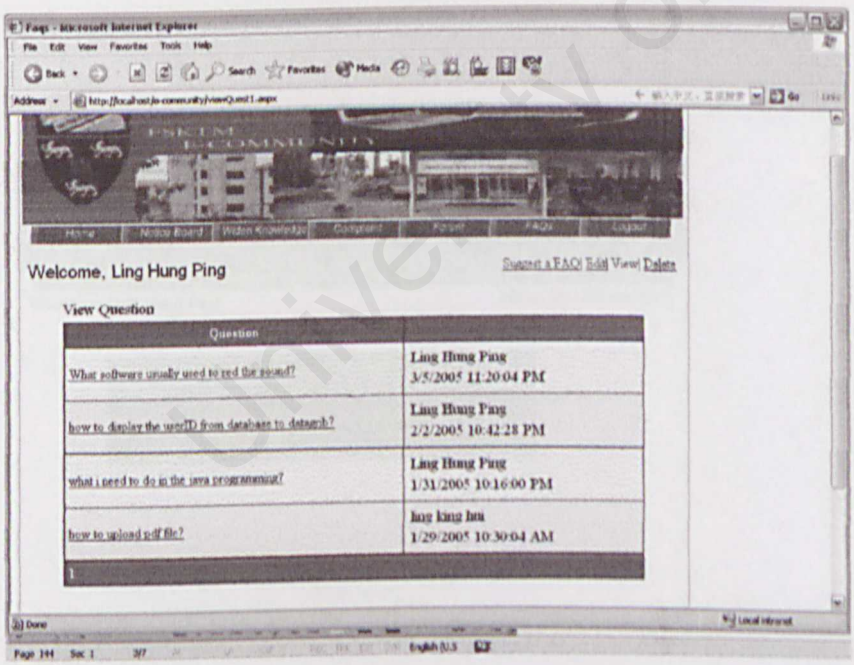


Figure7.2: Question that have been add was showed in view question list

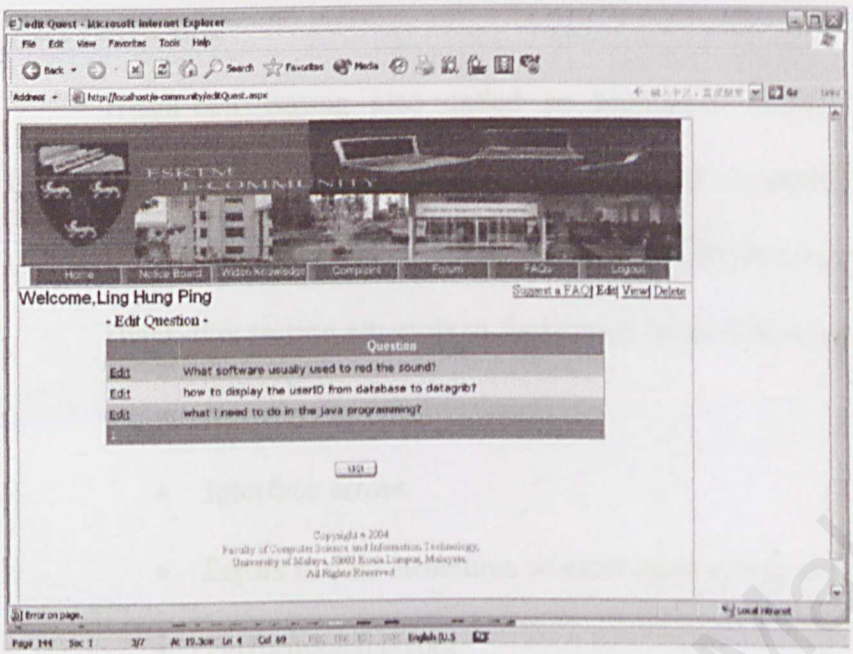


Figure7.3: Edit the question at Edit question function

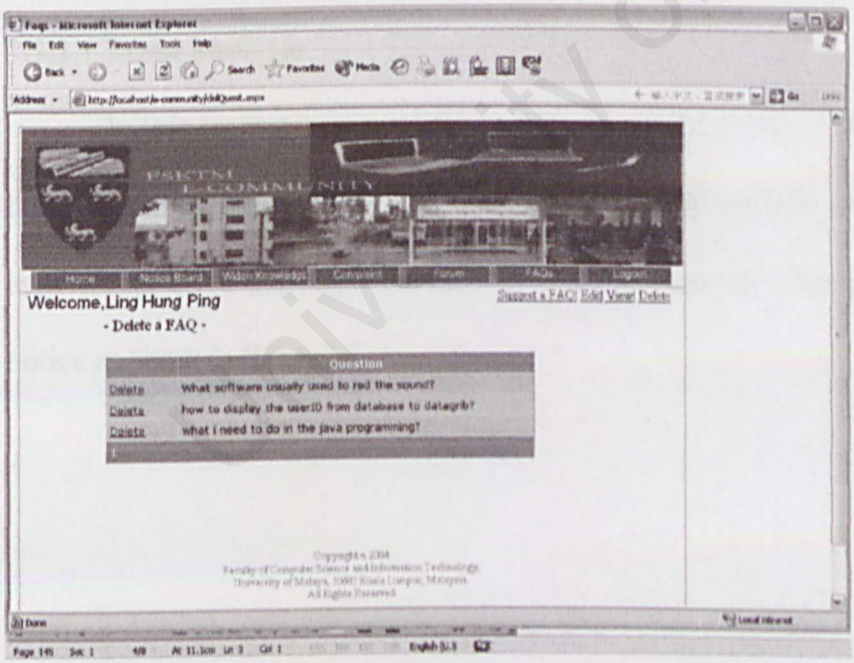


Figure7.4: delete the question at Delete question function

7.2.2 Black Box

Black-box testing also called as behavioral testing. It involves testing of functions of a module without knowing the logic structure of the code. Input was provided and output was verified manually to check for accuracy.

Black-box testing attempts to find errors in the following categories:

- Incorrect or missing functions
- Interface errors
- Errors in data structures or external database access
- Performance errors
- Initialization and termination errors

7.2.2.1 Input analysis

In this testing, some mistakes were makes by tester in the web form to see how the system will react and determine whether the system will prompt the tester with the appropriate error message. For example, tester was not filling the title or description notice as show in figure7.5.

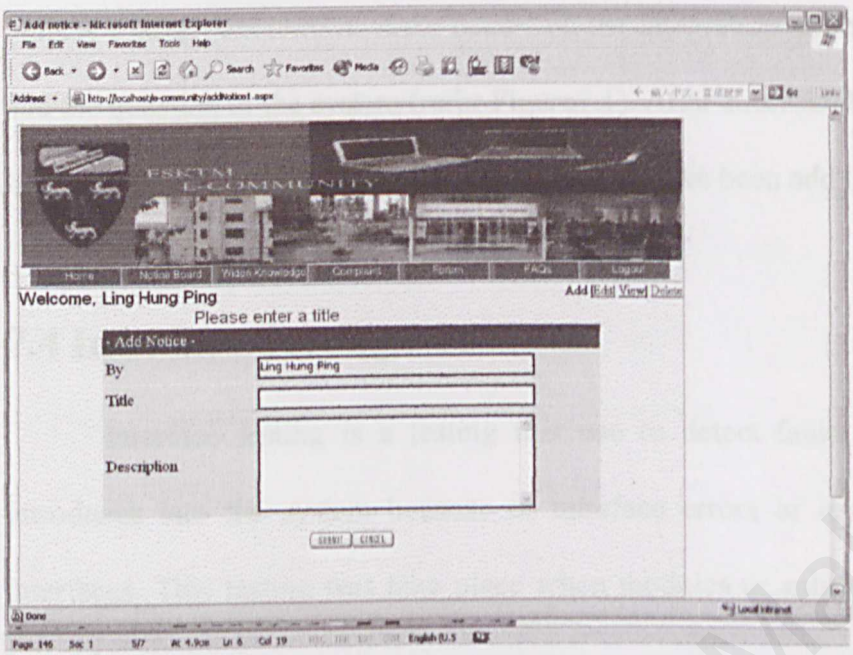


Figure7.5 Error message was display when user was not filling the title field or description field.

7.3 Module Testing

A module is a collection of dependent components such as an object class, an abstract data type or some looser collection of procedures and functions. To ensure that the module was run correctly after integration of units or functions, a testing was carry out, which are Module testing.

The objective of this testing is to test the interfacing and integration between the tested units that form the module and to test the integration between the modules that form the system. The modules are tested with some dummy data. If any error occurs, unit testing is done to check on the specified unit or function of the program. Then, these

units are integrated until no error occurs on the integration module. As an example, user add the question in the system (refer Figure7.1). After successful add the question, it will link to the display page to showing that question have been add (refer Figure7.2).

7.4 Interface Testing

Interface testing is a testing that use to detect faults which may have been introduces into the system because of interface errors or invalid assumptions about interfaces. This testing was take place when modules or sub-systems are integrated to create larger systems.

To prevent the error occur because of the interface, the interface that was design should be user-friendly and not misleading. It is crucial to ensure the user understands what they are doing and what is the expected outcome. Description of the functions or guideline was given in the system. Besides, error message that was showing much be clear and straight to point.

7.5 Integration Testing

After the module testing, all modules that were developed separately were combined to form a complete system. Integration testing is carrying out to ensure valid linking and dynamic relationship establishments between modules of the whole system and between sub–modules contained in all individual modules.

The approaches that have been used in this testing are the Top-Down Integration approach. That means highest level of the main module was tested first and then followed by the sub-modules. Every link to all modules and sub-modules was tested. Besides, all the components are tested again after integration. White box and black box was repeated and every output was verified again. The flow of information between modules was validates for accuracy and completeness.

7.6 System Testing

System testing was the final test that was carried out to the system. It includes a series of different tests whose primary purpose is to fully exercise the whole system to uncover its limitation and to measure its capabilities. This test includes the testing on the performance, reliability, accuracy and others criteria. Besides, it is also concerned with validating that the system meets its functional and non-functional requirements. Testers that were involved in this type of the testing are not the system developer. They accessed the system to determine its ability to suit the current office environment. Each user was assigned to different modules to test and the error that was occurring was jotted down for further correction.

7.7 Summary

Tested and debugged has been done effectively to the system to ensure that the system was developed according to its specification and every function implemented in a program works correctly. However, there is no foolproof testing method that will ensure that programs are free of errors. Although, the result of the various tests were taken into account and changes were done where needed.

CHAPTER 8
CONCLUSION & FUTURE ENVIRONMENT

Chapter 8: Conclusion and Future Environment

8.1 Introduction

After the testing of the FSKTM E-COMMUNITY system, conclusion and future environment has been carried out to the end product of the project. This is a process of evaluating the system that has been developed by identifying the problems encountered, system strengths and system limitations. Besides, it also highlights future enhancements of the system. They were many evaluation techniques that used to evaluate the final system. The following section will explain in detail about the conclusion and future environment.

8.2 System Strength

8.2.1 Attractive and Easy-to-User Interface

The graphic interface design of the system was designed to let the users feel comfortable and easy-to-use. The GUI ensured user friendliness. Menu bar and buttons that are provided in the system are easily for user link to the page that they interested.

8.2.2 Wide-Accessibility

FSKTM E-COMMUNITY system is an online system. That mean users can always access the system at any places or anywhere in the world as long as they can access internet. In others word, users just need have Internet Explorer 4.0 or above as a basic tool on the PC to access our system.

8.2.3 High Integrated Modules

All modules in the FSKTM E-COMMUNITY system are highly integrated. That mean data changes and updates in anyone of the module can be detected and copied to other linked modules.

Besides, buttons that pressed by the users, such as submit button can be link to other page by bring along the information to display at others page. This will cause data entry and management time to be reduced.

8.2.4 Coding Reusability

All the functions that are written in the FSKTM E-COMMUNITY system are in VB.net file. It can easily reuse and understand by developers. Besides, header and footer page that are written in .ascx file can be easily add in the any web page.

8.2.5 Reliability and Accuracy

Interface design on the whole FSKTM E-COMMUNITY system is consistent, which are consists of header, menu bar, information part and footer. Thus, users will feel comfortable with our system interface. Besides, our system also provided error message to the users for any errors that made by them. For example, users must fill the title or description before can submit the information. But users just fill the title. Message will be display to let users know that they also need to fill description.

8.2.6 Easy Management and Maintenance

FSKTM E-COMMUNITY system allows the users to manage and maintain the system easily through user-friendly graphical interface. User can easily add, delete, update and view data in the database by just pressed on the related button. That mean

users don't need to write and know any SQL statement in order to add, edit, delete or query the data in the database.

8.2.7 Authorization and Authentication

Login page are provided in the system to allow the authorized users access the Home page. That means user needs to enter username and password before they allow access the Home page.

8.3 System Limitations

8.3.1 Provide Simple Function

FSKTM E-COMMUNITY system is a very simple system which just adds the data into database and displays the data that retrieved from database. It not provide upload file and images functions.

8.3.2 Not provide admin part

FSKTM E-COMMUNITY system is provides to users to use this system. Users allow adding, updates and delete the data only add by them.

8.4 Problem and Solution

During development of the FSKTM E-COMMUNITY system, many problems were encountered. Some of the problems were overcome through the certain solution. Experience was gained when trying to find a solution for the problem. However, some of the problems were not being solved due to unforeseen circumstances

8.4.1 Research Challenges

Before FSKTM E-COMMUNITY was developed, researches have been carrying out to study several aspects related to the system. Search information from internet and brainstorming has been carried out to design the components and modules of FSKTM E-COMMUNITY system. However, face some problem when doing the research.

As an example, don't have idea on design interface, how to display menu bar, information, connect the system to database. Error occurs during debug the program. Thus, spent more time to ask for the friends and search information from the internet.

8.4.2 Lack of knowledge in programming languages

FSKTM E-COMMUNITY system was developed by using some programming languages, which are ASP.NET, VB.NET and scripting. Problem encountered when system is developed by those programming language especially ASP.NET and VB.NET. This is because doesn't using those programming language before. Besides, it is hard to understanding such a large amount of the information in a short time. Solution to overcome this problem is searching for the books and articles for study those languages, searching sample codes from internet, and asking the friends.

8.4.3 Set Up, Configuration and Installation Problem

Before developed the FSKTM E-COMMUNITY system, server, database and related software need to install or set up in computer. Unfortunately, I don't have software and thus need borrow from friend. After successful borrow the software from the friend, I don't have experience in installing or setting up that software. Thus, i need to try and ask for the others people for help. Error occurs when install or set up the

server and those related software. I need to uninstalled and set up that software again and again. Besides, it was also taking a long time to install the Microsoft Visual Studio .NET Framework because of large of size file.

Beside that, problem occurs in make the connection between system and database. I search from internet; book and friend for solve this problem.

8.5 Future Enhancement

Some functionality of the system can be enhanced or some new functionally can be add in the system in order to improve the quality of the system. The following are the functions that can be enhanced on the system.

8.5.1 Provide Admin part

FSKTM E-COMMUNITY system just provide to user. It will cause the irresponsible users to add unrelated information into particular module. Thus, it should provide the admin site to handle this type of problem. Admin enable to update, remove, the unnecessary information and add new module into this system. So this will make the system become more effective and update.

8.5.2 Allow User upload the files, images

FSKTM E-COMMUNITY system just allows the user to add any information by type in the words or copy and paste information into the form. It will take a lot of time for user to add information into this system. Thus, it should be enhanced for allow the

users to upload their files or images in the system especially at Widen Knowledge and Forum module part.

8.6 Summary

When developed the FSKTM E-COMMUNITY system, a lot of research, time and effort have been involved to make this project successful and fulfilled the tasks as requirements. However, there are also some limitations in the system. It needs to be enhanced in order to transform it to a more advance system.

At the completion of this project, FSKTM E-COMMUNITY system has been achieved its objectives, as well as the functional and non-functional requirements as planned at the beginning of the project. Many problems faced during developed the system and find a way to solve the problems. More knowledge was gained when developed the system, such as how to develop a system, planned a system, using the programming languages and others. FSKTM E-COMMUNITY system is easy to learn and use and users can master it within a short learning time.

APPENDIX

USER MANUAL

User Manual

To Access FSKTM E-COMMUNITY System

Users can only access to system with login mode. In the login mode, users can access all the information that it applied to them. In other words, users can only access the information that they are authorized to access. For example, user only can modify and delete the information add by them. The login to this system is by UserName and Password.

Following are the minimum requirements for access the system:

User Hardware Requirements

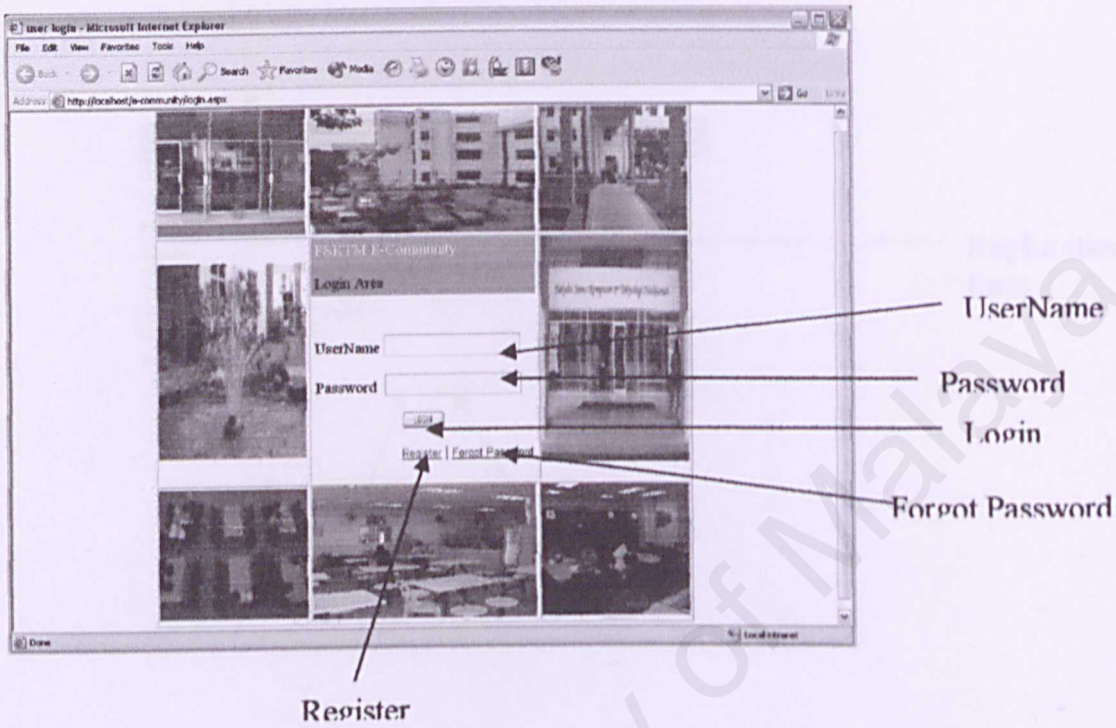
1. personal computer with at least 32 MB RAM
2. Network connection through existing network configuration or modem (recommended at least 28.8 Kbps)
3. Microsoft Internet Explorer Version 5.0 and above.

To gain access to FSKTM E-COMMUNITY System, you have to key in the following URL address into your browser's address bar:

http://localhost/e-community/login.aspx

You will see the following page after you successfully connected to FSKTM E-COMMUNITY Server.

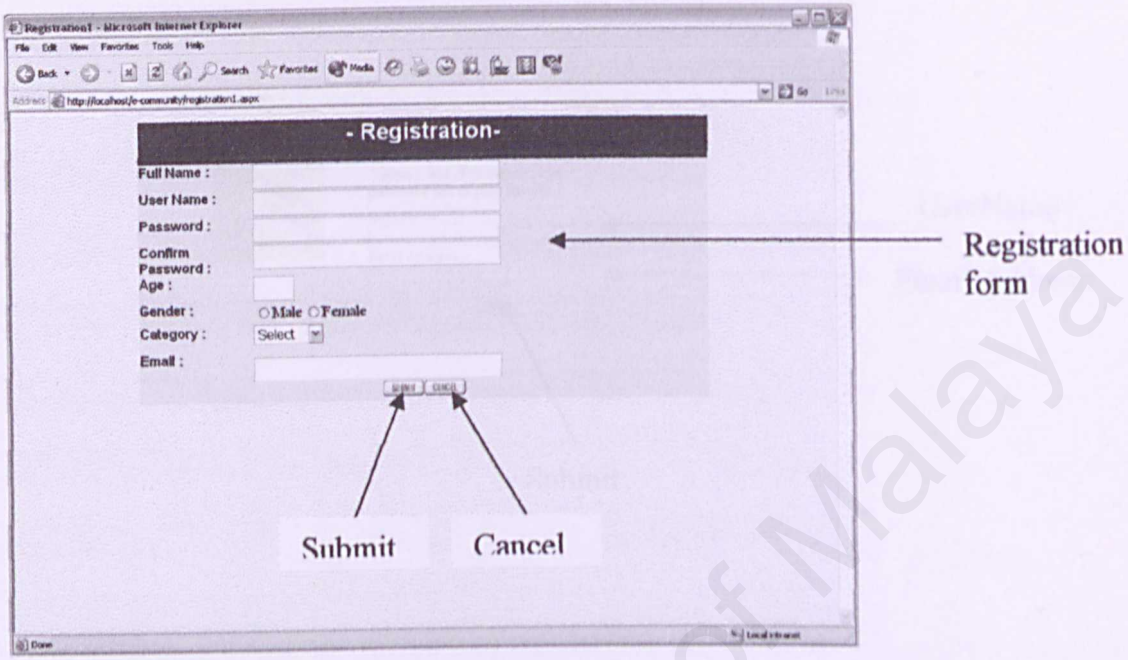
Login Page



Page Descriptions:

1. UserName - field for users to key in their UserName
2. Password - field for users to key in their Password.
3. Login Buttons - users can slick here for login to the system
4. Register - users can click here to register as member.
5. Forgot Password - users can click here to search their password.

Registration Page



Description:

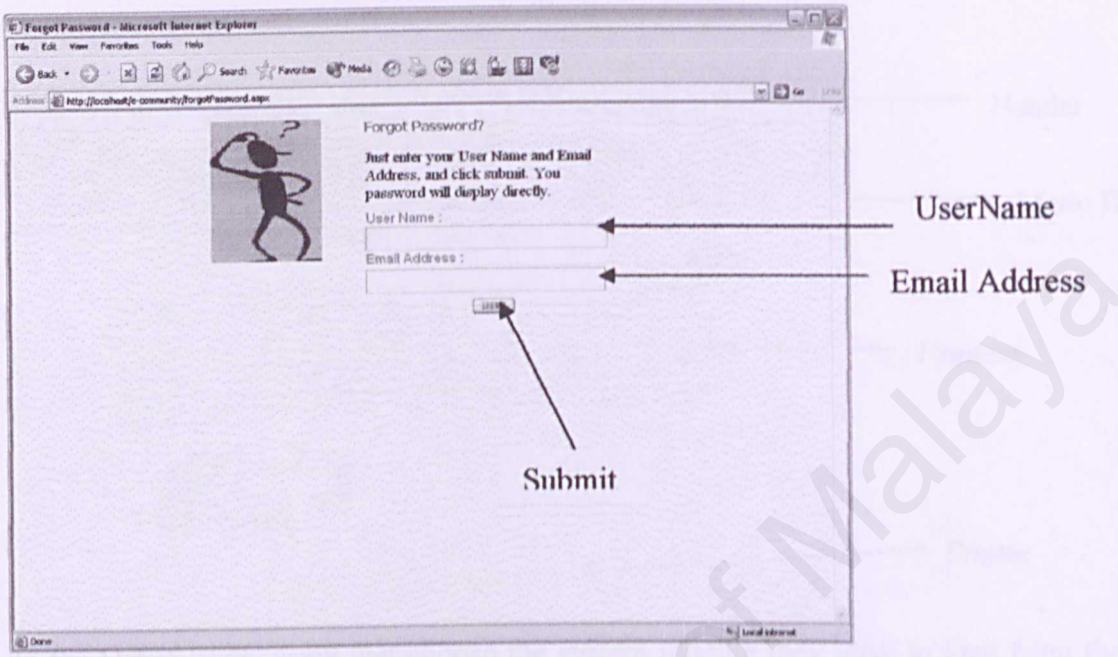
To register a member, users can click the register link and a registration page will display.

Users have to fill in the information.

Page button:

1. Submit – users can click here to submit the form.
2. Cancel - users can click here to reset the wrong data input.

Forgot Password Page



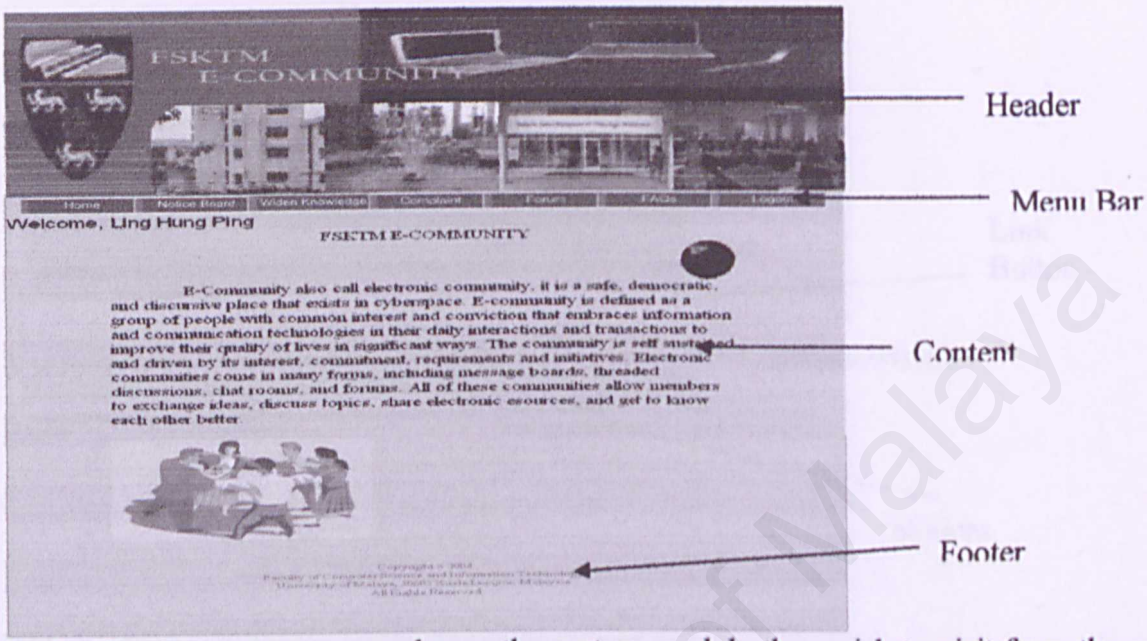
Description:

Users can search their password from this page if forgot their password. They can fill in the user name and email address and click submit button and the password will display in this page.

Page Button:

Submit – users can click here to search their password in database.

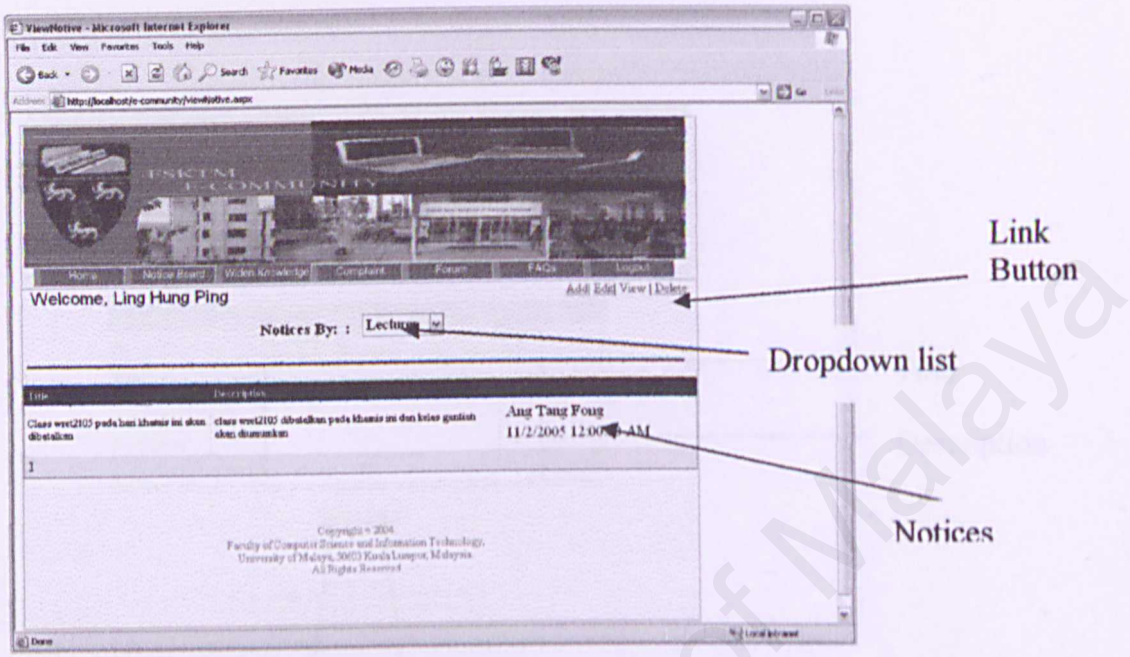
Home Page



In the Home page, users can choose the system module they wish to visit from the page top bar.

Menu Bar – users can choose the system module from here.

View Notice Board Page



Users can click the dropdown list to view the notices type. Beside that, users can add, edit and delete the notices add by them.

Dropdown List – users can view the notices to select notice by lecturer, staff or student.

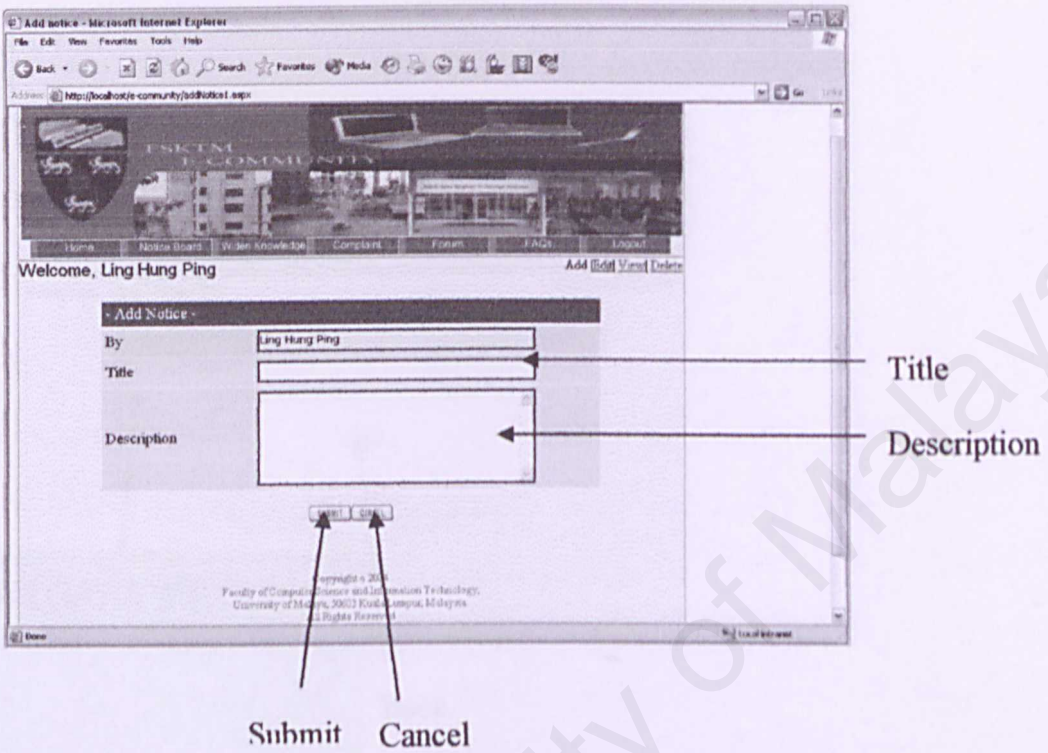
Add Link – users can click the Add Link to add the notice.

Edit Link – users can click the Edit Link to edit the notices only add by them.

View Link – users can click the View Link to view the notices.

Delete Link – users can click the Delete Link to delete the notices only add by them.

Add Notice Page



For this page, users can add the notice.

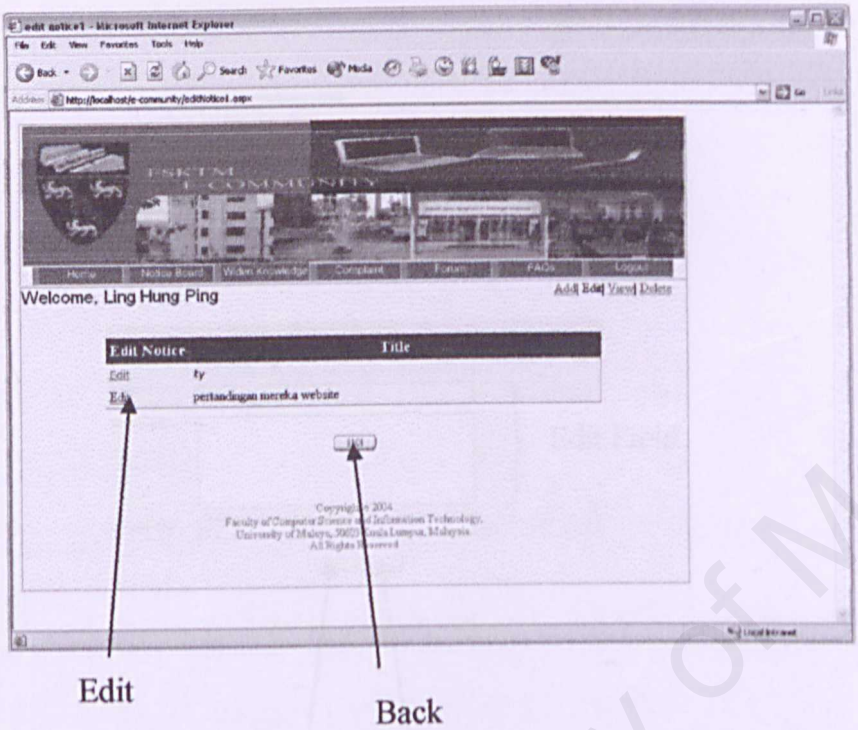
Title field – users need to fill the notice title in this field.

Description field – users need to fill the notice here.

Submit Button – click button Submit to save the notice.

Cancel Button – users can click the cancel to reset the notice.

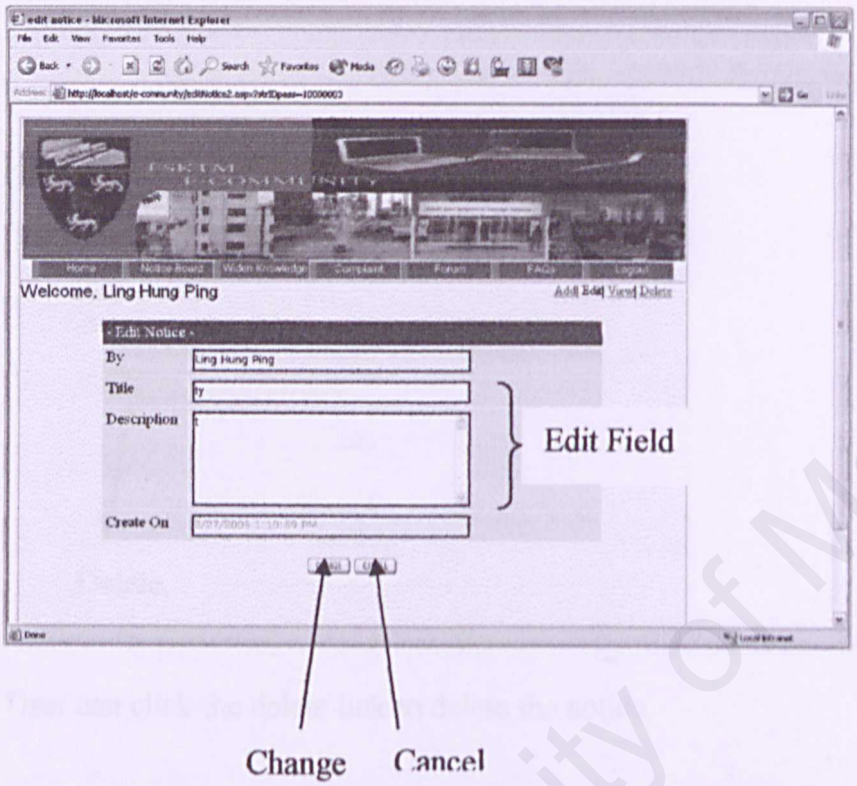
Edit Notice Page1



Link Edit – user can click the edit link to edit page to update the notice add by user

Back Button- user can click the Back button to go to view notice page.

Edit Notice Page2

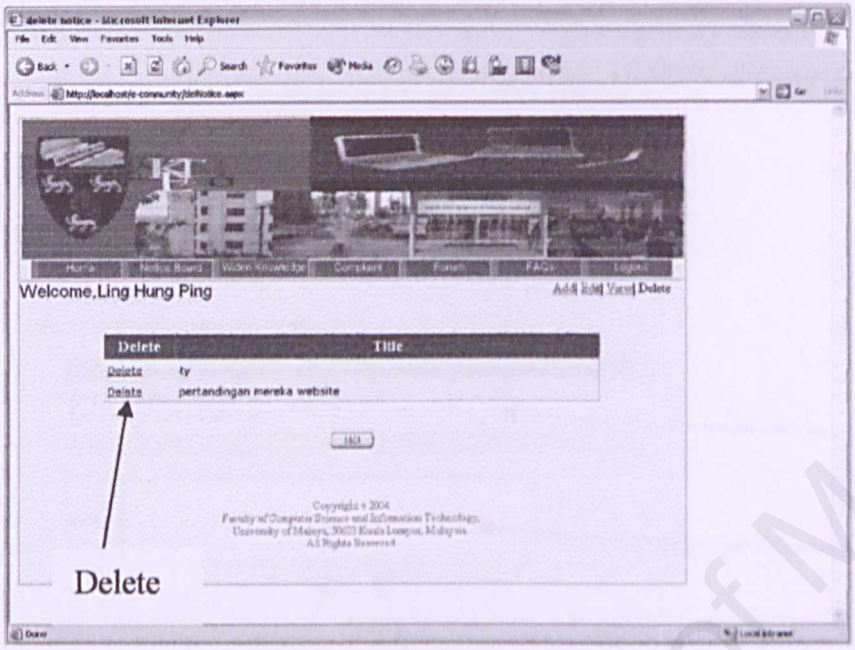


User can change the notice in edit field.

Change Button- user click the change button to update the notice.

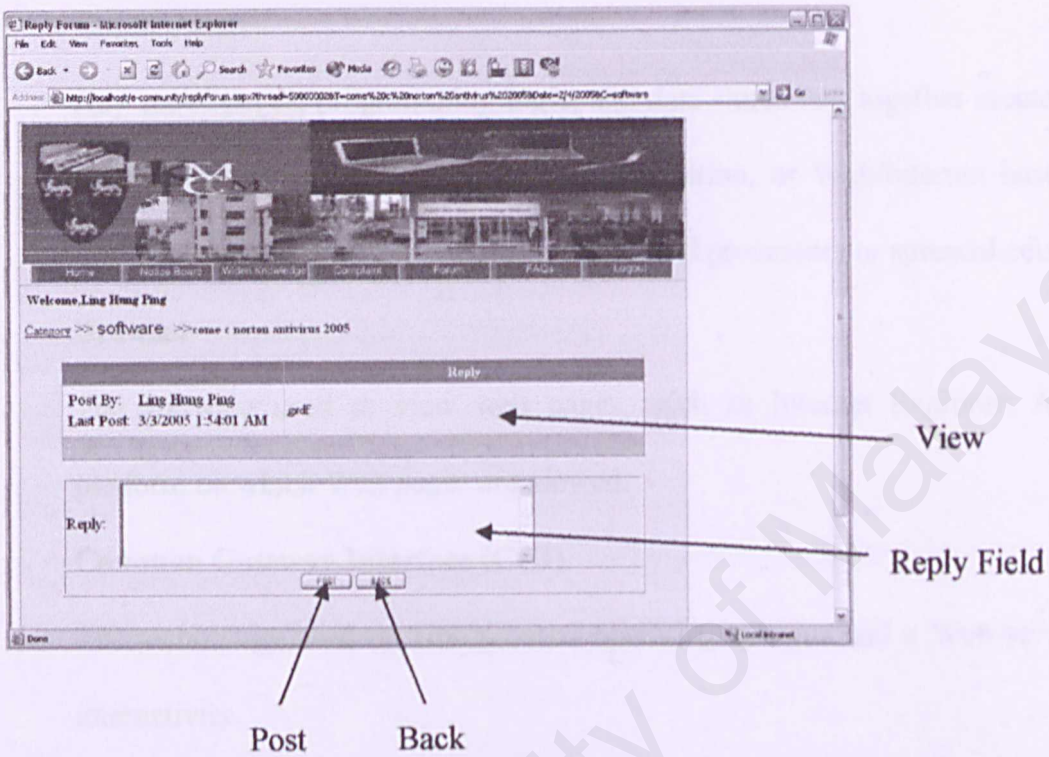
Cancel Button – user click the cancel button to go to view notice page.

Delete Notice Page



User can click the delete link to delete the notice.

Add Reply Page



Users can view the reply of forum in this page and users also can post their reply in the reply field.

Reply Field – allows users fill the reply here.

Post Button – users click on the Post button to save their reply.

Back Button – users can click Back button to go back to the thread page.

GLOSSARY

ADO (Active Data Object)

Constructs ASP can use to work with conforming database.

Application

Any set of pages, programming logic, and data stores that together create an interactive application. Not necessarily just ASP application, or Web/Internet based, application also refers to traditional programs such as word processors or spreadsheets.

Browser

The software used to view web pages, such as Internet Explorer. Also called the platform on which Web pages are viewed.

Common Gateway Interface (CGI)

The technology used on UNIX-based operating systems and a Web servers to provide interactivity.

Data type

The name of the type of data stored in a variable, such as text, number, logical, and so forth.

DBMS

Also RDBMS, meaning Relational Database Management System.

Development Environment

The tools and conditions present on your system when you are developing applications.

Dynamic Web Page

A Web page that presents a variety of information dependent on the context and user defined.

Hosting

Providing space on a server computer for a Web site or application, typically with high-speed, dedicated Internet access.

HTML (Hypertext Markup Language)

The language used to direct browser to display information content.

IIS (Internet Information Server)

Microsoft's industrial-strength Web server software.

ODBC (Open Database Connectivity)

The standard by which most database can be accessed.

Operating System

The software that sets the operating environment for the application and server software, and manages the hardware.

Platform

In this context, refers to the operating system or browser in use.

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